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OF THE

ASSEMBLY

OF THE

STATE OF NEW YORK.

ONE HUNDRED AND THIRTY-FOURTH SESSION

1911.

VOL. VIII.—NOS. 12 to 19, INCLUSIVE.

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

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REPORT OF THE COMPTROLLER

ON THE

Expenditures of the Canals

FOR THE YEAR 1910

TRANSMITTED TO THE LEGISLATURE JANUARY 4, 1911

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

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No. 12.

IN ASSEMBLY

JANUARY 4, 1911.

ANNUAL REPORT

OF THE

Comptroller Relating to the Canals.

STATE OF NEW YORK:

COMPTROLLER'S OFFICE,
ALBANY, N. Y., *December* 31, 1910.

To the Speaker of the Assembly:

Sir.— I have the honor herewith to transmit the annual report of the Comptroller exhibiting the financial transactions and the condition of the finances of the State relating to canals for the fiscal year ended September 30, 1910.

I am, sir,

Respectfully yours,
CLARK WILLIAMS,
Comptroller.

REPORT.

STATE OF NEW YORK:

Comptroller's Office, Bureau of Canal Affairs,
Albany, N. Y., *December* 31, 1910.

To the Legislature:

The Comptroller herewith submits the annual statement of the receipts and expenditures on account of the canals, and the canal debt, the balance of funds on hand in the treasury, the depositories and investments of the same and the condition thereof at the close of the fiscal year ended September 30, 1910.

	Securities	Cash	Total
Balances October 1, 1909	$17,678,661 35	$10,751,751 92	$28,430,413 27
Less unexpended balances in hands of Superintendent of Public Works and Division Engineers on October 1, 1909	....	26,739 36	26,739 36
	$17,678,661 35	$10,725,012 56	$28,403,673 91
Receipts:			
Par value of securities sold or redeemed	Deduct 4,068,679 97	Add 4,068,679 97	....
Other receipts	....	15,998,886 78	15,998,886 78
	$13,609,981 38	$30,792,579 31	$44,402,560 69
Expenditures:			
Par value of securities purchased	Add 4,782,587 34	Deduct 4,782,587 34	....
Other expenditures	....	13,180,513 65	13,180,513 65
	$18,392,568 72	$12,829,478 32	$31,222,047 04
Add unexpended balances in hands of Superintendent of Public Works and Division Engineers on September 30, 1910	....	20,425 85	20,425 85
Balances September 30, 1910	$18,392,568 72	$12,849,904 17	$31,242,472 89

The foregoing balances of securities and cash are applicable to the following funds:

FUND	Securities	CASH		Tota
		In bank	Unexpended balances	
Sinking Funds for the Redemption of the Canal Debt:				
Under Article 7, Section 1 of the Constitution	....	$160 00	....	$160 00
Under Article 7, Section 3 of the Constitution	....	500 00	....	500 00
Under Article 7, Section 4 of the Constitution and Chapter 79 of the Laws of 1895	$5,537,401 81	1,983,297 99	....	7,520,699 80
Under Article 7, Section 4 of the Constitution and Chapter 147 of the Laws of 1903	682,000 00	223,454 45	....	905,454 45
Under Article 7, Section 4 of the Constitution and Chapters 147 and 302 of the Laws of 1903 and 1906	12,173,166 91	1,136,339 02	....	13,309,505 93
Under Article 7, Section 4 of the Constitution and Chapters 147 and 66 of the Laws of 1903 and 1910	....	90,946 25	....	90,946 25
Under Article 7, Section 4 of the Constitution and Chapters 391 and 139 of the Laws of 1909 and 1910	....	7,637 57	....	7,637 57
Total Sinking Funds	$18,392,568 72	$3,442,335 28	....	$21,834,904 00
Fund for Ordinary Repairs	....	1,191,568 08	$3,534 67	1,195,102 75
Fund for Extraordinary Repairs	....	183,187 30	1,206 07	184,393 37
Fund for the Construction of the Erie, Champlain and Oswego Canals	....	7,042,061 90	12,493 82	7,054,555 72
Fund for the Construction of the Cayuga and Seneca Barge Canal	....	970,325 76	3,191 29	973,517 05
Totals, all Funds	$18,392,568 72	$12,829,478 32	$20,425 85	$31,242,472 89

The relations of the Canal Debt Sinking Funds to the Canal Debt are shown in the following:

Comparative Statement as of the close of the Fiscal Year, September 30, 1910.

CHARACTER OF DEBT	SINKING FUNDS			Amount of debt
	Securities	Cash	Total	
Non-interest bearing Canal Debt:				
Erie and Champlain 6 per cent canal stock, redeemable July 1, 1837.....	....	$160 00	$160 00	$160 00
Stock for payment of 6 per cent canal revenue certificates, redeemable July 1, 1873.....................	....	500 00	500 00	500 00
				$660 00
Interest bearing Canal Debt:				
Loan at 3 per cent for improving the Erie, Champlain and Oswego canals, pursuant to Chapter 79, Laws of 1895:				
Redeemable January 1, 1912.....	....	....	....	$4,000,000 00
Redeemable January 1, 1913.....	....	....	....	3,230,000 00
	$5,537,401 81	1,983,297 99	7,520,699 80	$7,230,000 00
Loan at 3 per cent for construction of the Erie, Champlain and Oswego canals, pursuant to Chapter 147, Laws of 1903 and amendments:				
Redeemable January 1, 1923.....	682,000 00	223,454 45	905,454 45	$2,000,000 00
Redeemable January 1, 1956.....	....	....	....	$1,000,000 00
Redeemable January 1, 1957.....	....	....	....	5,000,000 00
Redeemable July 1, 1958........	....	....	....	5,000,000 00
Redeemable January 1, 1959.....	....	....	....	10,000,000 00
	12,173,166 91	1,136,339 02	13,309,505 93	$21,000,000 00
Loan at 4 per cent for construction of the Erie, Champlain and Oswego canals, pursuant to Chapter 147, Laws of 1903 and amendments:				
Redeemable July 1, 1960........	....	90,946 25	90,946 25	$10,000,000 00
Loan at 4 per cent for construction of the Cayuga and Seneca Barge canal, pursuant to Chapter 391, Laws of 1909 and amendments:				
Redeemable July 1, 1960........	....	7,637 57	7,637 57	$1,000,000 00
Total Canal Debt Sinking Funds and Canal Debt......................	$18,392,568 72	$3,442,335 28	$21,834,904 00	$41,230,660 00

The details of the foregoing statements are submitted in the subjoined pages.

Very respectfully,

CLARK WILLIAMS,

Comptroller.

DOCUMENTS ACCOMPANYING THE REPORT OF THE COMPTROLLER.

STATEMENT SHOWING SECURITIES AND CASH IN THE CANAL FUNDS, OCTOBER 1, 1909, THE RECEIPTS AND EXPENDITURES DURING THE FISCAL YEAR AND THE SECURITIES AND CASH IN THE CANAL FUNDS SEPTEMBER 30, 1910.

	Canal debt sinking funds.	Construction funds.	Maintenance and repair funds.	Total.
Balance in funds, October 1, 1909	$20,677,221 07	$6,414,020 24	$1,339,171 96	$28,430,413 27
Less securities in funds	17,678,661 35			17,678,661 35
Less unexpended cash in hands of Superintendent of Public Works and division engineers.		22,658 37	4,080 99	26,739 36
Cash in bank, October 1, 1909	$2,998,559 72	$6,391,361 87	$1,335,090 97	$10,725,012 56
RECEIVED DURING YEAR:				
Transfers from General Fund.				
Into Canal Debt Sinking Funds, annual contribution to said funds, being an amount equal to the proceeds of a state tax on the real and personal property in the State subject to taxation	$1,043,940 82			$1,043,940 82
Into Canal Fund, on account of appropriations payable from the Canal Fund			$1,291,998 42	1,291,998 42
Par value of bonds sold		$11,000,000 00		11,000,000 00
Par value of Comptroller's temporary certificates issued		1,520,000 00		1,520,000 00
Premium on bonds sold	77,462 60			77,462 60
Accrued interest on bonds sold	19,435 04			19,435 04
Deposit with bid forfeited	20 00			20 00
Par value of securities sold or redeemed	4,068,679 97			4,068,679 97
Premiums on securities sold	39,701 10			39,701 10
Accrued interest on securities sold	11,464 22			11,464 22
Interest on investments	689,614 85			689,614 85
Interest on deposits	204,988 16		54,350 03	259,338 19
Miscellaneous receipts		6,168 03	39,743 51	45,911 54
Total receipts during year	$6,155,306 76	$12,526,168 03	$1,386,091 96	$20,067,566 75
Transferred from Fund for Surveys, Cayuga and Seneca Lakes to Fund for Ordinary Repairs in repayment of advance			6,900 00	6,900 00
Transferred from Fund for Survey from Seneca River to Cayuga Lake to Fund for Construction of Cayuga and Seneca Barge Canal per Chapter 513, Laws of 1910		455 07		455 07
Total receipts during year, including transfers	$6,155,306 76	$12,526,623 10	$1,392,991 96	$20,074,921 82
	$9,153,866 48	$18,917,984 97	$2,728,082 93	$30,799,934 38

STATEMENT SHOWING SECURITIES, ETC.—(*Continued*).

	Canal debt sinking funds.	Construction funds.	Maintenance and repair funds.	Total.
EXPENDITURES DURING YEAR:				
Superintendent of Public Works.				
Maintenance and ordinary repairs..........	....	....	$1,009,459 06	$1,009,459 06
Extraordinary repairs..........	....	....	91,609 68	91,609 68
Construction, Erie, Champlain and Oswego canals..........	....	$7,577,035 92	....	7,577,035 92
Salaries and office expenses..........	....	....	32,627 20	32,627 20
Administrative expenses..........	....	....	48,203 08	48,203 08
Collection of statistics..........	....	....	14,120 69	14,120 69
State Engineer and Surveyor.				
Travel, self and deputy..........	....	....	2,640 04	2,640 04
Division Engineers.				
Ordinary repairs..........	....	....	30,000 00	30,000 00
Extraordinary repairs..........	....	....	6,964 24	6,964 24
Surveys for attorney-general..........	....	....	2,950 00	2,950 00
Mapping canal lands..........	....	....	4,000 00	4,000 00
Survey Cayuga and Seneca Lake..........	....	....	13,100 00	13,100 00
Construction, Erie, Champlain and Oswego canals..........	....	894,311 27	....	894,311 27
Construction, Cayuga and Seneca Barge Canal.	....	29,000 00	....	29,000 00
Comptroller's Office—Bureau of Canal Affairs.				
Salaries of clerks, stenographers and watchman	....	3,700 00	7,865 00	11,565 00
Preparing bonds on account of the constructon of the Erie. Champlain and Oswego canals..	....	6,489 43	....	6,489 43
Preparing bonds on account of the construction of the Cayuga and Seneca Barge Canal....	....	930 00	....	930 00
Advertising sale of bonds on account of the construction of the Erie, Champlain and Oswego canals..........	....	2,018 29	....	2,018 29
Advertising sale of bonds on account of the construction of the Cayuga and Seneca Barge canal..........	....	199 31	....	199 31
Traveling expenses in the delivery of bonds...	....	91 15	....	91 15
Stenographic services at meeting of canal board.	....	65 60	....	65 60
Bank of Manhattan Company, keeping transfer office..........	....	....	2,125 00	2,125 00
Michael Stern, services as transfer agent..........	....	....	750 00	750 00
Stationery and printing for transfer office..........	....	....	136 75	136 75
Recording deeds of lands taken for canal purpurposes..........	....	136 26	....	136 26
Miscellaneous expenses..........	....	....	1,800 00	1,800 00
Attorney-General.				
Prosecution, violations of the canal law..........	....	....	512 29	512 29
Advisory Board of Consulting Engineers.				
Salaries and expenses..........	....	41,664 86	....	41,664 86
Special Examiner and Appraiser.				
Salaries and expenses..........	....	7,263 14	....	7,263 14
Canal Terminal Commission.				
Salaries and expenses..........	....	....	12,019 76	12,019 76
Damages on Account of the Construction of the Erie, Champlain and Oswego Canals.				
For lands and damages, including interest....	....	777,289 25	....	777,289 25
To contractors, including interest..........	....	4,463 92	....	4,463 92
Damages on Account of Existing Canals.				
Judgments of the court of claims and interest..	....	....	53,970 98	53,970 98
Investigation of Claims.				
Services and expenses of agent..........	....	40,938 91	11,118 71	52,057 62
REIMBURSEMENT OF COMPTROLLER:				
Temporary Certificates.				
On account of construction of the Erie, Champlain and Oswego canals..........	....	1,500,000 00	....	1,500,000 00
On account of the Cayuga and Seneca barge canal..........	....	20,000 00	....	20,000 00
Carried forward..........	....	$10,905,597 31	$1,315,972 48	$12,251,569 79

STATEMENT SHOWING SECURITIES, ETC.—(*Concluded*).

	Canal debt sinking funds.	Construction funds.	Maintenance and repair funds.	Total.
Brought forward	....	$10,905,597 31	$1,345,972 48	$12,251,569 79
Canal Debt Sinking Funds.				
Par value of securities purchased	$4,782,587 34	....	....	4,782,587 34
Premium on securities purchased	7,400 00	....	....	7,400 00
Accrued interest on securities purchased	10,189 99	....	....	10,189 99
Interest on debt	906,900 00	....	....	906,900 00
Interest on Comptroller's temporary certificates.	4,453 87	....	....	4,453 87
Total expenditures during year	$5,711,531 20	$10,905,597 31	$1,345,972 48	$17,963,100 99
Transferred to Fund for Ordinary Repairs from Fund for Surveys, Cayuga and Seneca Lakes in repayment of advance	....	....	6,900 00	6,900 00
Transferred to Fund for Construction of Cayuga and Seneca Barge Canal from Fund for Survey from Seneca River to Cayuga Lake, per Chapter 513, Laws of 1910	....	....	455 07	455 07
Total expenditures during year, including transfers	$5,711,531 20	$10,905,597 31	$1,353,327 55	$17,970,456 06
Cash in bank, September 30, 1910	$3,442,335 28	$8,012,387 66	$1,374,755 38	$12,829,478 32
Add securities in funds	18,392,568 72	....	....	18,392,568 72
Add unexpended cash in hands of Superintendent of Public Works and Division Engineers	....	15,685 11	4,740 74	20,425 85
Balance in funds, September 30, 1910	$21,834,904 00	$8,028,072 77	$1,379,496 12	$31,242,472 89

THE CASH IN THE TREASURY ON SEPTEMBER 30, 1910, WAS ON DEPOSIT IN THE FOLLOWING INSTITUTIONS IN THE AMOUNTS NAMED:

Depository.		
Albany:		
New York State National Bank	$615,978	32
Albany County Bank	40,000	00
Albany Trust Company	110,000	00
First National Bank	160,000	00
Mechanics and Farmers Bank	100,000	00
Union Trust Comany	70,000	00
New York City (Manhattan and Bronx):		
American Exchange National Bank	150,000	00
Astor Trust Company	44,000	00
Bankers Trust Company	511,000	00
Bank of Manhattan Company	705,000	00
Bank of Washington Heights	18,000	00
Bronx National Bank	25,000	00
Bryant Park Bank	15,000	00
Carnegie Trust Company	188,000	00
Century Bank	71,000	00
Chase National Bank	100,000	00
Chelsea Exchange Bank	64,000	00
Coal and Iron National Bank	12,000	00
Columbia Bank	91,000	00
Columbia Trust Company	380,000	00
Commercial Trust Company	83,000	00
Empire Trust Company	323,000	00
Equitable Trust Company	150,000	00
Fourteenth Street Bank	61,000	00
Fulton Trust Company	23,000	00
Greenwich Bank	38,000	00
Guaranty Trust Company	10,000	00
Guardian Trust Company	25,000	00
Hudson Trust Company	260,000	00
Hungarian-American Bank	16,000	00
Carried forward	$4,458,978	32

New York City (Manhattan and Bronx) — Continued.

Brought forward	$4,458,978 32
Knickerbocker Trust Company	200,000 00
Lawyers Title Insurance and Trust Co.	450,000 00
Lincoln Trust Company	50,000 00
Madison Trust Company	250,000 00
Manhattan Trust Company	120,000 00
Mechanics and Metals National Bank	68,000 00
Mercantile National Bank	59,000 00
Merchants Exchange National Bank	154,000 00
Metropolitan Trust Company	150,000 00
Mutual Alliance Trust Company	8,000 00
Nassau Bank	84,000 00
National Park Bank	27,000 00
National Reserve Bank	40,000 00
New Netherland Bank	57,000 00
New York Produce Exchange Bank	69,000 00
Night and Day Bank	50,000 00
Nineteenth Ward Bank	39,000 00
Plaza Bank	34,000 00
Public Bank of New York	5,000 00
Sherman National Bank	50,000 00
State Bank	100,000 00
Twelfth Ward Bank	20,000 00
Union Trust Company	575,000 00
Washington Trust Company	6,000 00
Windsor Trust Company	200,000 00

New York City (Borough of Brooklyn):

Brooklyn Bank	14,000 00
Citizens Trust Company	67,000 00
First National Bank	90,000 00
Franklin Trust Company	100,000 00
Hamilton Trust Company	100,000 00
Home Trust Company of New York	125,000 00
Kings County Trust Company	50,000 00
Long Island Loan and Trust Company	145,000 00
Mechanics Bank	10,000 00
Carried forward	$8,024,978 32

New York City (Borough of Brooklyn) — (Continued.	
Brought forward	$8,024,978 32
National City Bank	31,000 00
North Side Bank	12,000 00
People's National Bank	10,000 00
Peoples Trust Company	200,000 00
New York City (Borough of Queens, Jamaica):	
First National Bank	37,000 00
Queens County Trust Company	82,000 00
Auburn:	
Auburn Trust Company	35,000 00
Cayuga County National Bank	16,000 00
National Bank	54,000 00
Binghamton:	
Broome County Trust Company	5,000 00
First National Bank	6,000 00
Buffalo:	
Bank of Buffalo	56,000 00
Central National Bank	25,000 00
Citizens Bank	3,000 00
Columbia National Bank	17,000 00
Fidelity Trust Company	177,000 00
German-American Bank	120,000 00
Manufacturers and Traders National Bank.	57,000 00
Peoples Bank	10,000 00
Third National Bank	40,000 00
Union Stock Yards Bank	23,000 00
Cohoes:	
Manufacturers Bank	31,000 00
National Bank	101,000 00
Corning:	
First National Bank	15,000 00
Dunkirk:	
Lake Shore National Bank	27,000 00
Merchants National Bank	13,000 00
Elmira:	
Merchants' National Bank	3,000 00
Carried forward	$9,230,978 32

Brought forward	$9,230,978 32
Fulton:	
Citizens National Bank	14,000 00
First National Bank	22,000 00
Geneva:	
First National Bank	43,000 00
Geneva National Bank	15,000 00
Glens Falls:	
First National Bank	41,000 00
Glens Falls Trust Company	30,000 00
National Bank	25,000 00
Gloversville:	
City National Bank	8,000 00
Hornell:	
Bank of Steuben	8,000 00
Citizens National Bank	8,000 00
Ithaca:	
Tompkins County National Bank	9,000 00
Jamestown:	
First National Bank	25,000 00
National Chautauqua County Bank	77,000 00
Kingston:	
National Ulster County Bank	23,000 00
Rondout National Bank	27,000 00
Lackawanna:	
Lackawanna National Bank	6,000 00
Little Falls:	
National Herkimer County Bank	58,000 00
Mount Vernon:	
Mount Vernon Trust Company	16,000 00
Newburgh:	
Highland National Bank	43,000 00
New Rochelle:	
National City Bank	3,000 00
Carried forward	$9,731,978 32

Brought forward	$9,731,978 32
Niagara Falls:	
Bank of Niagara	23,000 00
Bank of Suspension Bridge	14,000 00
Niagara Falls Trust Company	28,000 00
Power City Bank	45,000 00
North Tonawanda:	
State National Bank	51,000 00
Ogdensburg:	
National Bank	8,000 00
Olean:	
Exchange National Bank	23,000 00
Oneonta:	
First National Bank	11,000 00
Oswego:	
First National Bank	62,000 00
Second National Bank	15,000 00
Poughkeepsie:	
First National Bank	9,000 00
Rensselaer:	
Rensselaer County Bank	17,000 00
Rochester:	
Central Bank	30,000 00
Fidelity Trust Company	88,000 00
Lincoln National Bank	144,000 00
National Bank of Commerce	175,000 00
Rochester Trust and Safe Deposit Company	158,000 00
Security Trust Company	41,000 00
Traders' National Bank	27,000 00
Union Trust Company	75,000 00
Rome:	
Farmers' National Bank	11,000 00
Schenectady:	
Citizens' Trust Company	8,000 00
Mohawk National Bank	10,000 00
Schenectady Trust Company	45,000 00
Carried forward	$10,849,978 32

Brought forward	$10,849,978 32
Syracuse:	
Commercial National Bank	9,000 00
Merchants' National Bank	5,000 00
Salt Springs National Bank	23,000 00
State Bank of Syracuse	27,000 00
Syracuse Trust Company	27,000 00
Trust and Deposit Company of Onondaga	27,000 00
Tonawanda:	
First National Bank	25,000 00
Troy:	
Manufacturers' National Bank	150,000 00
National City Bank	36,000 00
People's Bank	18,000 00
Security Trust Company	5,000 00
Troy Trust Company	47,000 00
Union National Bank	41,000 00
Utica:	
Citizens' Trust Company	37,000 00
First National Bank	88,000 00
Second National Bank	5,000 00
Utica City National Bank	144,000 00
Watertown:	
Northern New York Trust Company	46,000 00
Watertown National Bank	23,000 00

DEPOSITS OUTSIDE OF CITIES.

Albion:	
Citizens' National Bank	25,000 00
Orleans County National Bank	11,000 00
Allegany:	
First National Bank	6,000 00
Amityville:	
Bank of Amityville	7,000 00
Andover:	
Burrows National Bank	10,000 00
Carried forward	$11,691,978 32

Brought forward	$11,691,978 32
Argyle:	
First National Bank	6,000 00
Belfast:	
First National Bank	5,000 00
Berlin:	
Taconic Valley Bank	9,000 00
Boonville:	
First National Bank	5,000 00
National Exchange Bank	8,000 00
Canandaigua:	
Canandaigua National Bank	5,000 00
Canisteo:	
First State Bank	5,000 00
Chatham:	
State Bank	11,000 00
Clayton:	
National Exchange Bank	4,000 00
Cobleskill:	
Farmers and Merchants' Bank	5,000 00
Cooperstown:	
First National Bank	20,000 00
Second National Bank	15,000 00
Corinth:	
Corinth National Bank	14,000 00
Delhi:	
Delaware National Bank	15,000 00
Dolgeville:	
First National Bank	6,000 00
Earlville:	
First National Bank	9,000 00
Farmingdale:	
Bank of Farmingdale	1,500 00
Fredonia:	
Citizens' Trust Company	15,000 00
Gainesville:	
Gainesville National Bank	9,000 00
Carried forward	$11,859,478 32

Brought forward	$11,859,478 32
Glen Cove:	
Nassau Union Bank	20,000 00
Grand Gorge:	
First National Bank	2,000 00
Granville:	
Farmers' National Bank	18,000 00
Granville National Bank	19,000 00
Greenwich:	
First National Bank	4,000 00
Hamburgh:	
Bank of Hamburgh	25,000 00
Peoples Bank	10,000 00
Herkimer:	
Herkimer National Bank	16,000 00
Hoosick Falls:	
First National Bank	11,000 00
Peoples National Bank	11,000 00
Hudson Falls:	
Peoples National Bank	27,000 00
Sandy Hill National Bank	16,000 00
Huntington:	
Bank of Huntington	18,000 00
Lake George:	
First National Bank	5,000 00
Lancaster:	
Bank of Lancaster	10,000 00
Lestershire:	
First National Bank	10,000 00
Little Valley:	
Cattaraugus County Bank	4,000 00
Lyons:	
Bank of Wayne	6,000 00
Mayville:	
State Bank of Mayville	10,000 00
Medina:	
Union Bank	11,000 00
Carried forward	$12,112,478 32

Brought forward	$12,112,478	32
Milford:		
Milford National Bank	5,000	00
Mount Morris:		
Genesee River National Bank	11,000	00
Newark:		
Arcadia National Bank	45,000	00
Northport:		
Bank of Northport	6,000	00
First National Bank	14,000	00
Norwich:		
Chenango National Bank	26,000	00
National Bank	50,000	00
Nyack:		
Rockland County Trust Company	10,000	00
Oriskany Falls:		
First National Bank	5,000	00
Ossining:		
First National Bank	11,000	00
Ossining National Bank	36,000	00
Owego:		
Owego National Bank	10,000	00
Tioga National Bank	15,000	00
Patchogue:		
Citizens National Bank	11,000	00
Peekskill:		
Westchester County National Bank	100,000	00
Penn Yan:		
Citizens Bank	16,000	00
Philmont:		
First National Bank	6,000	00
Port Chester:		
Mutual Trust Company of Westchester Co.	50,000	00
Potsdam:		
Citizens National Bank	27,000	00
Prattsburgh:		
Prattsburgh State Bank	9,000	00
Carried forward	$12,575,478	32

Brought forward	$12,575,478 32
Pulaski:	
Pulaski National Bank	4,000 00
Riverhead:	
Suffolk County Trust Company	20,000 00
Rye:	
Rye National Bank	10,000 00
Salem:	
Peoples National Bank	6,000 00
Saratoga Springs:	
First National Bank	38,000 00
Schoharie:	
Schoharie County Bank	10,000 00
Schuylerville:	
National Bank	8,000 00
Sharon Springs:	
First National Bank	11,000 00
Sherman:	
State Bank	9,000 00
Sidney:	
Sidney National Bank	40,000 00
Silver Creek:	
State Bank	6,000 00
Stony Brook:	
Bank of Suffolk County	4,000 00
Warrensburg:	
Emerson National Bank	12,000 00
Warsaw:	
Wyoming County National Bank	28,000 00
Waverly:	
First National Bank	14,000 00
Wellsville:	
First National Bank	4,000 00
Westfield:	
National Bank	10,000 00
Carried forward	$12,809,478 32

Brought forward	$12,809,478 32
Whitehall:	
National Bank	9,000 00
Worcester:	
Bank of Worcester	11,000 00
	$12,829,478 32

Statement of Cash Balances, Obligations and Adjustments Leading into Surplus Account for the Fiscal Year Ended September 30, 1910.

Cash in the treasury at end of year		$12,829,478 32
Which is subject to the following obligations:		
Uninvested moneys of Canal Debt Sinking Fund:		
Under article 7, section 1 of the Constitution	$160 00	
Under article 7, section 3 of the Constitution	500 00	
Under article 7, section 4 of the Constitution, and chapter 79, Laws of 1895	1,983,297 99	
Under article 7, section 4 of the Constitution, and chapter 147, Laws of 1903	223,454 45	
Under article 7, section 4 of the Constitution, and chapter 147, Laws of 1903, and chapter 302, Laws of 1906	1,136,339 02	
Under article 7, section 4 of the Constitution, and chapter 147, Laws of 1903, and chapter 66, Laws of 1910	90,946 25	
Under article 7, section 4 of the Constitution, and chapter 391, Laws of 1909, and chapter 139, Laws of 1910	7,637 57	
	$3,442,335 28	
Unexpended moneys, for Barge canal construction:		
Erie, Champlain and Oswego	7,042,061 90	
Cayuga and Seneca	970,325 76	
		11,454,722 94
Available cash surplus		$1,374,755 38

Which is subject to adjustments, for the purpose of keeping within fiscal years the appropriations derivable from the receipts of those years, as follows:	
Deduct, as liability for total amount of those appropriations created by law in 1909 which are unexpended at this date...............	$100,077 17
	$1,274,678 21
Add, as a charge against future receipts the total amount of those immediately available appropriations, which were expended in the fiscal year	73,200 28
Balance — surplus after adjustments.....	$1,347,878 49

Statement Showing Condition of Appropriations During the Fiscal Year Ended September 30, 1910.

FOR WHAT PURPOSE.	Chapter.	Laws.	Available October 1, 1909.	Appropriations of 1910.	Expenditures during year.	Lapsed during year.	Unexpended Balance September 30, 1910.	
							Appropriations prior to 1910.	Appropriations of 1910.
Ordinary Repairs.								
Maintenance and ordinary repairs	432 512	1909 1910	$800,000 00	$800,000 00	$800,000 00	....	....	$800,000 00
Salaries and expenses of Superintendent of Public Works, deputy and assistants	432 512	1909 1910	24,500 00	24,500 00	22,203 08	$2,296 92	....	24,500 00
Clerk hire and office expenses of Superintendent and assistants and collectors and inspectors	432 512	1909 1910	34,844 00	36,644 00	33,531 50	1,312 50	....	36,644 00
Salaries and expenses in the collection of statistics	432 512	1909 1910	17,463 00	17,663 00	13,216 39	4,246 61	....	17,663 00
Salaries of Superintendent of Repairs	432 512	1909 1910	26,000 00	26,000 00	26,000 00	....	....	26,000 00
Travel of State Engineer and Surveyor and deputy	432	1909	3,000 00	....	2,640 04	....	$359 96	....
Clerk hire and office expenses of Bureau of Canal Affairs	432 512	1909 1910	13,865 00	14,265 00	12,676 75	1,188 25	....	14,265 00
Salaries of gate tenders for the State dams upon the Beaver and Moose rivers	432 512	1909 1910	1,100 00	1,100 00	1,100 00	....	....	1,100 00
Repairs and improvements	290 437 533	1908 1909 1910	206,840 14	125,000 00	179,268 89	....	27,571 25	125,000 00
Surveys and maps for use of Attorney-General in Court of Claims	466 433 513	1908 1909 1910	3,000 00	5,000 00	2,950 00	....	50 00	5,000 00
Salary and expenses of agent, witness fees, etc., in defense of claims	433 513	1909 1910	7,300 78	15,000 00	11,118 71	....	....	11,182 07
Judgments of the Court of Claims	451 535	1909 1910	19,491 04	50,000 00	53,970 98	....	....	15,520 06
Salaries and expenses of engineers	432 512	1909 1910	30,000 00	30,000 00	30,000 00	....	....	30,000 00

Restoring roadway on west shore of Owasco lake, town of Fleming	700 556 187	1905 1907 1909	2,528 77	....	....	....	2,528 77	....
Cement sidewalks, city of Oneida	433	1909	1,600 00	....	1,592 16	....	7 84	....
Paving Vandevoort street, North Tonawanda	433	1909	1,000 00	....	....	....	1,000 00	....
Mapping canal lands	199	1910	....	25,000 00	4,000 00	....	....	21,000 00
Prosecution of canal cases by Attorney-General	513	1910	....	1,100 00	512 29	....	....	587 71
Moyer creek improvement	513	1910	....	4,000 00	904 64	....	....	3,095 36
Wall, Steele creek, Ilion, rebuilding, etc	513	1910	....	4,000 00	1,032 04	....	....	2,967 96
F. C. Stevens, Superintendent of Public Works, inspection boat	513	1910	....	23,397 61	23,082 57	....	....	315 04
North Tonawanda, paving assessment	513	1910	....	488 97	488 97	....	....	....
Bridges, Eighteen Mile creek, maintenance, etc	513	1910	....	500 00	....	....	....	500 00
State ditch, Tonawanda, cleaning, etc	513	1910	....	5,000 00	873 15	....	....	4,126 85
Waterford, paving assessment	513	1910	....	224 72	224 72	....	....	....
Bridge, Fort Plain, repairs to	513	1910	....	1,200 00	308 00	....	....	892 00
Lyons, paving assessment	513	1910	....	257 06	....	....	....	257 06
Improvement, Oriskany creek feeder	518	1910	....	3,000 00	583 92	....	....	2,416 08
Total	......	......	$1,192,532 73	$1,213,340 36	$1,222,278 80	$9,044 28	$31,517 82	$1,143,032 19
EXTRAORDINARY REPAIRS.								
Constructing coffer dam at outlet of Skaneateles lake	675 394	1906 1908	$3,192 40	....	....	$3,192 40	....	....
Cleaning out Steele creek, village of Ilion	578 187	1907 1909	191 13	....	$20 43	....	$170 70	....
Repair of breakwater "D" in Seneca lake at Watkins	264	1908	2,695 67	....	586 45	2,109 22	....	....
Constructing steel bridge over Champlain canal at Mohawk street, Waterford	265	1908	79 29	....	....	79 29	....	....
Constructing bridge over Cayuga and Seneca canal at Ovid street, Seneca Falls	273 356	1908 1910	11,400 00	....	....	....	11,400 00	....
Constructing bridge over outlet of Cazenovia lake, village of Cazenovia	281 356	1908 1910	911 79	....	....	....	911 79	....
Repairs of sea wall, foot of Owasco lake	282 356	1908 1910	2,381 73	....	....	....	2,381 73	....
Constructing lift bridge over Erie canal at Lyell avenue, Rochester	287	1908	18,786 24	....	....	18,786 24	....	....
Constructing lift bridge over Erie canal at Allen street, Rochester	291 356	1908 1910	27,850 07	....	8,242 80	....	19,607 27	....
Improvement of Eighteen Mile creek, etc	466 433	1908 1909	10,000 00	....	8,988 95	....	1,011 05	....
Repairing, etc., dam on Beaver river, town of Stillwater	466	1908	286 74	....	....	286 74	....	....
Improvement of Black River canal, etc	196	1909	57,769 13	....	52,934 96	....	4,834 17	....
Canal Terminal Commission	438 213	1909 1910	9,977 65	$10,000 00	12,019 76	....	....	$7,957 89

STATEMENT SHOWING CONDITION OF APPROPRIATIONS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910 — (*Continued*).

FOR WHAT PURPOSE.	Chapter.	Laws.	Available October 1, 1909.	Appropriations of 1910.	Expenditures during year.	Lapsed during year.	UNEXPENDED BALANCE SEPTEMBER 30, 1910.	
							Appropriations prior to 1910.	Appropriations of 1910.
Constructing bridge over Erie canal at Georgia street, Buffalo	452	1909	$19,192 97	....	$10,059 67	....	$9,133 30	....
Constructing bridge over Erie canal at Franklin street, Syracuse	453 527	1909 1910	17,000 00	....	2,800 00	....	14,200 00	....
Constructing bridge over Erie canal at Seneca street, Utica	454	1909	19,000 00	....	14,090 66	....	4,909 34	....
Constructing bridge over State feeder, city of Oneida	519	1910	....	$5,000 00	....	....	....	$5,000 00
Constructing bridge over Erie canal at South Washington street, Rome	522	1910	....	20,000 00	850 00	....	....	19,150 00
Improvement of weighlock building, Syracuse.	524	1910	....	15,000 00	....	....	....	15,000 00
Total	......	......	$200,714 81	$50,000 00	$110,593 68	$24,453 89	$68,559 35	$47,107 89
Survey, Cayuga and Seneca lakes	433	1909	$13,100 00	....	$13,100 00	....	....	....
Construction, Cayuga and Seneca Barge canal	391 139	1909 1910	....	$1,000,000 00	$30,129 31	....	....	$969,870 69
Construction, Erie, Champlain and Oswego canals	147 143 172 195	1903 1905 1907 1907	$6,373,511 46	$10,000,000 00	$9,355,468 00	....	....	$7,018,043 46

SUMMARY.								
Ordinary repairs	......	......	$1,192,532 73	$1,213,340 36	$1,222,278 80	$9,044 28	$31,517 82	$1,143,032 19
Extraordinary repairs	......	......	200,714 81	50,000 00	110,593 68	24,453 89	68,559 35	47,107 89
Survey, Cayuga and Seneca lakes	......	......	13,100 00	....	13,100 00	....	....	....
Construction, Cayuga and Seneca Barge canal	......	......	....	1,000,000 00	30,129 31	....	....	969,870 69
Construction, Erie, Champlain and Oswego canals	......	......	6,373,511 46	10,000,000 00	9,355,468 00	....	....	7,018,043 46
			$7,779,859 00	$12,263,340 36	$10,731,569 79	$33,498 17	$100,077 17	$9,178,054 23
Reimbursement of Comptroller's temporary certificates	......	......	....	....	1,520,000 00			
Canal debt sinking fund	......	......	....	....	5,711,531 20			
					$17,963,100 99			

STATEMENT SHOWING BALANCES UNEXPENDED OCTOBER 1, 1909, EXPENDITURES AND VOUCHERS RENDERED DURING THE YEAR AND BALANCES UNEXPENDED SEPTEMBER 30, 1910.

FOR WHAT PURPOSE.	Balance October 1, 1909.	Expenditures during year.	Vouchers rendered during year.	Balance September 30, 1910.
Superintendent of Public Works.				
Maintenance and ordinary repairs	$46 78	$1,009,459 06	$1,009,189 70	$316 14
Extraordinary repairs		91,609 68	91,609 68	
Construction, Erie, Champlain and Oswego canals		7,577,035 92	7,577,035 92	
Administrative expenses		48,203 08	48,203 08	
Salaries and office expenses		32,627 20	32,627 20	
Collection of statistics		14,120 69	14,120 69	
State Engineer and Surveyor.				
Travel, self and deputy		2,640 04	2,640 04	
Division Engineer.				
Ordinary repairs	1,204 53	30,000 00	31,204 53	
Extraordinary repairs	487 69	6,964 24	6,245 86	1,206 07
Surveys for attorney-general	1,608 63	2,950 00	3,016 41	1,542 22
Mapping canal lands		4,000 00	2,323 69	1,676 31
Survey, Cayuga and Seneca Lake	733 36	13,100 00	13,833 36	
Construction, Erie, Champlain and Oswego canals	22,658 37	894,311 27	904,475 82	12,493 82
Construction, Cayuga and Seneca Barge Canal		29,000 00	25,808 71	3,191 29
Comptroller's Office — Bureau of Canal Affairs.				
Salaries of clerks, stenographers and watchman		11,565 00	11,565 00	
Preparing Barge Canal bonds		7,419 43	7,419 43	
Advertising sale of Barge Canal bonds		2,217 60	2,217 60	
Transfer office, services and expenses		3,011 75	3,011 75	
Recording deeds		136 26	136 26	
Miscellaneous expenses		1,956 75	1,956 75	
Attorney-General.				
Prosecuting violations of Canal Law		512 29	512 29	
Advisory Board of Consulting Engineers.				
Salaries and expenses		41,664 86	41,664 86	
Special Examiner and Appraiser.				
Salaries and expenses		7,263 14	7,263 14	
Canal Terminal Commission.				
Salaries and expenses		12,019 76	12,019 76	
Damages on Account of the Erie, Champlain and Oswego Canals.				
For lands and damages, including interest		777,289 25	777,289 25	
To contractors, including interest		4,463 92	4,463 92	
Damages on Account of Existing Canals.				
Judgments of the Court of Claims and interest		53,970 98	53,970 98	
Investigation of Claims.				
Salaries and expenses of agent		52,057 62	52,057 62	
Reimbursement of Comptroller's Temporary Certificates.				
On account of construction, Erie, Champlain and Oswego canals		1,500,000 00	1,500,000 00	
On account of construction, Cayuga and Seneca Barge Canal		20,000 00	20,000 00	
Canal Debt Sinking Fund.				
Par value of securities purchased		4,782,587 34	4,782,587 34	
Premium on securities purchased		7,400 00	7,400 00	
Accrued interest on securities purchased		10,189 99	10,189 99	
Interest on debt		906,900 00	906,900 00	
Interest on Comptroller's temporary certificates		4,453 87	4,453 87	
Total	$26,739 36	$17,963,100 99	$17,969,414 50	$20,425 85

SUMMARY OF THE VARIOUS FUNDS CHARGEABLE WITH THE VOUCHERS RENDERED FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, AND THE CANALS APPLICABLE THERETO.

CANALS.	Fund for ordinary repairs.	Fund for extraordinary repairs.	Fund for construction of the Erie, Champlain and Oswego Canals.	Fund for construction of Cayuga and Seneca Barge Canal.	Fund for survey, Cayuga and Seneca Lakes.	Total.
Erie and Champlain	$1,117,241 02	$56,353 89	$8,829,617 03	....	....	$10,003,211 94
Oswego	22,915 35	....	536,015 52	....	....	558,930 87
Cayuga and Seneca	28,911 02	....	....	$26,938 02	$13,833 36	69,682 40
Black River	52,536 68	52,934 96	....	....	....	105,471 64
Chemung	....	586 45	....	....	....	586 45
	$1,221,604 07	$109,875 30	$9,365,632 55	$26,938 02	$13,833 36	$10,737,883 30
Reimbursement of Comptroller's Temporary Certificates	....	....	....	....	....	1,520,000 00
Amount chargeable to Canal Debt Sinking Fund	....	....	....	....	....	5,711,531 20
						$17,969,414 50

SUMMARY OF VOUCHERS RENDERED BY FREDERICK C. STEVENS, SUPERINTENDENT OF PUBLIC WORKS, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF ORDINARY REPAIRS, EXTRAORDINARY REPAIRS AND CONSTRUCTION OF ERIE, CHAMPLAIN AND OSWEGO CANALS.

SUBDIVISION OF CANALS.	Ordinary repairs.	Extraordinary repairs.	Construction of Erie, Champlain and Oswego canals.	Total.
ERIE CANAL.				
General	$32,858 11	....	....	$32,858 11
Eastern Division	41,585 87	....	....	41,585 87
Middle Division	47,211 48	....	....	47,211 48
Western Division	57,006 55	....	....	57,006 55
Section 1	70,314 66	....	$445,171 31	515,485 97
Section 2	79,405 32	....	354,863 62	434,268 94
Section 3	40,849 87	....	470,090 11	510,939 98
Section 4	50,347 97	$20 43	499,089 21	549,457 61
Section 5	47,534 32	12,590 66	718,980 68	779,105 66
Section 6	54,979 89	....	288,215 38	343,195 27
Section 7	21,480 27	....	401,967 73	423,448 00
Section 8	47,721 67	....	420,713 60	468,435 27
Section 9	76,289 57	7,535 23	1,046,656 58	1,130,481 38
Section 10	60,781 13	8,988 95	1,207,593 98	1,277,364 06
Section 11	74,498 96	8,953 00	228,955 83	312,407 79
Total	$802,865 64	$38,088 27	$6,082 298 03	$6,923,251 94
CHAMPLAIN CANAL.				
Section 1	$36,159 31	....	$576,601 86	$612,761 17
Section 2	54,473 76	....	78,319 88	132,793 64
Section 3	19,721 15	....	412,341 07	432,062 22
Total	$110,354 22	....	$1,067,262 81	$1,177,617 03
Oswego Canal	$18,779 64	....	$427,475 08	$446,254 72
Cayuga and Seneca Canal	$27,351 12	....	....	$27,351 12
Black River Canal	$49,839 08	$52,934 96	....	$102,774 04
Chemung Canal	....	$586 45	....	$586 45
Total of all canals	$1,009,189 70	$91,609 68	$7,577,035 92	$8,677,835 30

Statement of Vouchers Rendered by Frederick C. Stevens, Superintendent of Public Works, for Ordinary Repairs for the Fiscal Year Ended September 30, 1910.

CANALS.	General: C. 432, L. 1909.	Repairs and Improvements: C. 290, L. 1908. C. 437, L. 1909.	Supply Bill Items: C. 433, L. 1909. C. 513, L. 1910.	Improvement of Oriskany Creek Feeder. C. 518, L. 1910.	Total.
Erie Canal.					
General	$9,775 54	....	$23,082 57	....	$32,858 11
Eastern	41,585 87	....	....	....	41,585 87
Middle	43,151 71	$4,059 77	....	....	47,211 48
Western	44,061 10	12,945 45	....	....	57,006 55
Section 1	64,000 99	6,313 67	....	....	70,314 66
Section 2	48,621 14	30,784 18	....	....	79,405 32
Section 3	32,649 97	7,891 90	308 00	....	40,849 87
Section 4	32,942 82	15,468 47	1,936 68	....	50,347 97
Section 5	38,623 64	6,734 60	1,592 16	$583 92	47,534 32
Section 6	40,917 73	14,062 16	....	....	54,979 89
Section 7	20,724 70	755 57	....	....	21,480 27
Section 8	39,170 29	8,551 38	....	....	47,721 67
Section 9	62,285 10	14,004 47	....	....	76,289 57
Section 10	54,231 04	6,550 09	....	....	60,781 13
Section 11	58,584 57	14,552 27	1,362 12	....	74,498 96
Total Erie Canal	$631,326 21	$142,673 98	$28,281 53	$583 92	$802,865 64
Champlain Canal.					
Section 1	$30,369 77	$5,564 82	$224 72	....	$36,159 31
Section 2	33,536 74	20,937 02	....	....	54,473 76
Section 3	19,090 15	631 00	....	....	19,721 15
Total Champlain Canal	$82,996 66	$27,132 84	$224 72	....	$110,354 22
Oswego Canal	$14,263 63	$4,516 01	....	....	$18,779 64
Cayuga and Seneca Canal	$22,823 69	$4,527 43	....	....	$27,351 12
Black River Canal	$49,420 45	$418 63	....	....	$49,839 08
Total of all Canals	$800,830 64	$179,268 89	$28,506 25	$583 92	$1,009,189 70

STATEMENT OF THE TRANSACTIONS OF THE SUPERINTENDENTS OF REPAIRS, SHOWING THE EXPENDITURES FOR THE YEAR ENDED SEPTEMBER 30, 1910, TOGETHER WITH DISTRIBUTION THEREOF.

CANAL.	Section.	Superintendents of repairs.	Expenditures.	DISTRIBUTION OF EXPENDITURES.			
				General repairs.	Inspectors, patrolmen, harbor masters, feeder-tenders, etc.	Lock tending.	Disbursement clerks.
Erie	1	Jacob M. Grass	$44,656 41	$6,940 67	$3,698 93	$33,116 81	$900 00
Erie	2	James Scanlon	26,531 26	8,215 69	3,437 49	14,308 08	570 00
Erie	3	Oliver Hurst	20,408 15	7,138 46	2,393 13	10,314 06	562 50
Erie	4	Charles Wallace	23,472 56	5,602 91	1,591 62	15,805 53	472 50
Erie	5	Daniel F. Breitenstein	16,721 33	9,539 12	4,921 65	1,698 06	562 50
Erie	6	Elmer J. Clark	21,682 09	8,842 70	3,057 10	8,922 67	859 62
Erie	7	Albert B. Hallett	12,484 53	6,499 39	2,158 04	3,302 10	525 00
Erie	8	R. A. Vanderboget	26,780 90	9,486 92	1,956 33	14,700 15	637 50
Erie	9	Jacob Allmeroth	27,731 13	9,054 95	9,782 59	8,256 09	637 50
Erie	10	Charles L. Papworth	34,038 65	12,521 73	13,426 84	7,490 08	600 00
Erie	11	W. J. Hingston	23,695 13	12,703 18	4,971 95	5,120 00	900 00
Champlain	1	John Richmond	20,784 71	6,082 53	3,993 36	10,228 82	480 00
Champlain	2	Patrick O'Grady	25,054 65	9,016 19	2,919 90	12,638 56	480 00
Champlain	3	George Neddo	14,866 36	6,794 32	2,169 11	5,422 93	480 00
Oswego	....	D. S. Burleigh	11,053 99	3,858 93	832 75	5,837 31	525 00
Cayuga and Seneca	....	Oliver E. Emens	10,878 69	4,601 76	1,055 84	4,771 09	450 00
Black River	....	Jerry A. Fiske	26,432 20	9,267 70	2,917 50	13,347 00	900 00
			$387,272 74	$136,167 15	$65,284 13	$175,279 34	$10,542 12

STATEMENT OF THE TRANSACTIONS OF THE VARIOUS DIVISION ENGINEERS SHOWING BALANCES UNEXPENDED OCTOBER 1, 1909, EXPENDITURES, VOUCHERS RENDERED AND BALANCES UNEXPENDED SEPTEMBER 30, 1910.

	Chapter.	Laws.	Balance October 1, 1909.	Expenditures durin year.	Vouchers rendered during year.	Balance September 30, 1910.
GEORGE D. WILLIAMS, DIVISION ENGINEER, EASTERN DIVISION.						
Ordinary Repairs—General.						
Erie Canal, Eastern Division	432	1909	....	$12,000 00	$7,992 28	....
Champlain Canal					4,007 72	....
Ordinary Repairs—Court of Claims Surveys.						
Erie Canal, Eastern Division	466 433	1908 1909	$607 83	1,000 00	711 39	$896 44
Ordinary Repairs—Mapping Canal Lands.						
Erie Canal, Eastern Division	199	1910	....	4,000 00	2,323 69	1,676 31
Construction, Erie, Champlain and Oswego Canals, Head Office.						
Erie Canal, Eastern Division	147 195	1903 1909	3,460 33	253,811 27	78,779 60	*24,084 13
Erie Canal, Middle Division					50,644 02	
Erie Canal, Western Division					95,660 96	
Champlain Canal					39,389 80	
Oswego Canal					16,881 35	
Erie Canal, Eastern Division	147 195	1903 1909	56 81	209,700 00	198,125 03	11,631 78
Champlain Canal	147 195	1903 1909	3,969 18	105,400 00	101,560 21	7,808 97
Total	....	....	$8,094 15	$585,911 27	$596,076 05	*$2,070 63
GUY MOULTON, DIVISION ENGINEER, MIDDLE DIVISION.						
Ordinary Repairs—General.						
Erie Canal, Middle Division	432	1909	....	$9,000 00	$8,871 70	....
Cayuga and Seneca Canal					59 90	
Black River Canal					68 40	
Ordinary Repairs—Court of Claims Surveys.						
Erie Canal, Middle Division	466 433	1908 1909	$600 97	1,950 00	2,033 20	$517 77

STATEMENT OF THE TRANSACTIONS OF THE VARIOUS DIVISION ENGINEERS SHOWING BALANCES UNEXPENDED OCTOBER 1, 1909, EXPENDITURES, VOUCHERS RENDERED AND BALANCES UNEXPENDED SEPTEMBER 30, 1910 —(*Concluded*).

	Chapter.	Laws.	Balance October 1, 1909.	Expenditures during year.	Vouchers rendered during year.	Balance September 30, 1910.*
Extraordinary Repairs.						
Construction, Seneca Street Bridge, Utica (Section 5, Erie)	454	1909	$187 66	$1,500 00	$1,684 65	$3 01
Construction, South Washington Street Bridge, Rome (Section 5, Erie)	522	1910	....	850 00	83 02	766 98
Construction, Franklin Street Bridge, Syracuse (Section 6, Erie)	453	1909	....	2,800 00	2,683 13	116 87
Construction, Ovid Street Bridge, Seneca Falls (Cayuga and Seneca)	273 356	1908 1910	300 03	....	....	300 03
Cayuga and Seneca Lake Survey	433	1909	733 36	13,100 00	13,833 36	....
Construction, Cayuga and Seneca Barge Canal	391 139	1909 1910	....	29,000 00	25,808 71	3,191 29
Construction, Erie, Champlain and Oswego Canals.						
Erie Canal, Middle Division	147 195	1903 1909	1,513 62	108,500 00	105,938 79	4,074 83
Oswego Canal	147 195	1903 1909	644 08	47,900 00	45,475 47	3,068 61
Total	....	....	$3,979 72	$214,600 00	$206,540 33	$12,039 39
THOMAS W. BARRALLY, DIVISION ENGINEER, WESTERN DIVISION.						
Ordinary Repairs—General.						
Erie Canal, Western Division	432	1909	$1,204 53	$9,000 00	$10,204 53	....
Ordinary Repairs—Court of Claims Surveys.						
Erie Canal, Western Division	466 433	1908 1909	399 83	....	271 82	$128 01
Extraordinary Repairs.						
Construction, Allen Street Bridge, Rochester (Section 9, Erie)	291 356	1908 1910	....	707 57	707 57	....
Construction, Georgia Street Bridge, Buffalo (Section 11, Erie)	452	1909	....	1,106 67	1,087 49	19 18
Construction, Erie, Champlain and Oswego Canals.						
Erie Canal, Western Division	147 195	1903 1909	13,014 35	169,000 00	172,020 59	9,993 76
Total	....	....	$14,618 71	$179,814 24	$184,292 00	$10,140 95
Total all Divisions	....	....	$26,692 58	$980,325 51	$986,908 38	$20,109 71

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* Overdraft due to "Head Office" vouchers for September, 1910, being paid in October, 1910.

STATEMENT SHOWING VOUCHERS RENDERED BY THE DIVISION ENGINEERS OF THE SEVERAL DIVISIONS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, THE NATURE OF THE WORK AND THE CANALS TO WHICH SUCH WORK IS CHARGEABLE.

	George D. Williams, division engineer, Eastern Division.	Guy Moulton, division engineer, Middle Division.	Thomas W. Barrally, division engineer, Western Division.	Total.
ORDINARY REPAIRS.				
Erie Canal	$10,315 97	$8,871 70	$10,204 53	$29,392 20
Champlain Canal	4,007 72	....	....	4,007 72
Cayuga and Seneca Canal	....	59 90	....	59 90
Black River Canal	....	68 40	....	68 40
	$14,323 69	$9,000 00	$10,204 53	$33,528 22
EXTRAORDINARY REPAIRS.				
Erie Canal	....	$4,450 80	$1,795 06	$6,245 86
Court of Claims Surveys	$711 39	$2,033 20	$271 82	$3,016 41
Cayuga and Seneca Lake Surveys	....	$13,833 36	....	$13,833 36
CONSTRUCTION OF ERIE, CHAMPLAIN AND OSWEGO CANALS.				
Erie Canal	$479,480 76	$105,938 79	$172,020 59	$757,440 14
Champlain Canal	101,560 21	....	....	101,560 21
Oswego Canal	....	45,475 47	....	45,475 47
	$581,040 97	$151,414 26	$172,020 59	$904,475 82
Construction of Cayuga and Seneca Barge Canal	....	$25,808 71	....	$25,808 71
	$596,076 05	$206,540 33	$184,292 00	$986,908 38

SUMMARY OF THE VARIOUS FUNDS CHARGEABLE WITH THE VOUCHERS RENDERED BY THE DIVISION ENGINEERS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, AND THE CANALS APPLICABLE THERETO.

	Ordinary repairs.	Extraordinary repairs.	Survey Cayuga and Seneca Lakes.	Construction, Cayuga and Seneca Barge Canal.	Construction, Erie, Champlain and Oswego Canals.	Total.
ERIE CANAL:						
Eastern Division	$11,027 36				$276,904 63	$287,931 99
Middle Division	10,904 90	$4,450 80	$13,833 36		156,582 81	185,771 87
Western Division	10,476 35	1,795 06			267,681 55	279,952 96
Total Erie Canal	$32,408 61	$6,245 86	$13,833 36		$701,168 99	$753,656 82
Champlain Canal	4,007 72				140,950 01	144,957 73
Oswego Canal					62,356 82	62,356 82
Cayuga and Seneca	59 90			$25,808 71		25,868 61
Black River Canal	68 40					68 40
Total all canals	$36,544 63	$6,245 86	$13,833 36	$25,808 71	$904,475 82	$986,908 38

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, EXCLUSIVE OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CAYUGA AND SENECA LAKE SURVEY, AND CONSTRUCTION OF CAYUGA AND SENECA BARGE CANAL.

DIVISION ENGINEERS.	On what account.	Total.	Salaries of division and resident engineers, etc.	All travel.	Assistant engineers.	Levelers.	Draughtsmen.	Rodmen.	Chainmen.	Clerk hire.
George D. Williams..........	Erie Canal, Eastern Division..	$11,027 36	$3,424 50	$200 05	$1,223 00	$163 50	$296 50	$823 50	$571 00	$699 99
Guy Moulton...............	Erie Canal, Middle Division..	15,355 70	1,776 88	462 49	3,928 50	200 00	3,298 63	180 00	....	2,045 00
Thomas W. Barrally..........	Erie Canal, Western Division..	12,271 41	4,079 50	429 33	690 00	....	847 38	76 00	....	4,961 36
	Total Erie Canal........	$38,654 47	$9,280 88	$1,091 87	$5,841 50	$363 50	$4,442 51	$1.079 50	$571 00	$7,706 35
George D. Williams..........	Champlain Canal...........	$4,007 72	$350 00	$17 63	$48 00	....	$18 00	$572 00	$5 00	$759 14
Guy Moulton...............	Cayuga and Seneca Canals....	$59 90	....	$25 59	$18 00	....	$10 00	....	....	....
Guy Moulton...............	Black River Canal..........	$68 40	....	$14 40	$54 00	....	....	....	....	....
	Total for all canals......	$42,790 49	$9,630 88	$1,149 49	$5,961 50	$363 50	$4,470 51	$1,651 50	$576 00	$8,465 49

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, EXCLUSIVE OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CAYUGA AND SENECA LAKE SURVEY, AND CONSTRUCTION OF CAYUGA AND SENECA BARGE CANAL — (*Concluded*).

DIVISION ENGINEERS.	On what account.	Labor.	Stationery and printing.	Livery.	Fuel and light.	Postage.	Office rent.	Telephone and telegraph.	Miscel-laneous.
George D. Williams	Erie Canal, Eastern Division	$210 00	$163 00	$7 50	$238 60	$395 00		$1,362 24	$1,248 98
Guy Moulton	Erie Canal, Middle Division	1,714 00	174 01	118 50	421 06	194 93		226 56	615 14
Thomas W. Barrally	Erie Canal, Western Division	76 00	89 91			09	$360 00	37 85	623 99
	Total Erie Canal	$2,000 00	$426 92	$126 00	$659 66	$590 02	$360 00	$1,626 65	$2,488 11
George D. Williams	Champlain Canal	$54 00	$191 95		$347 10	$381 73		$753 97	$509 20
Guy Moulton	Cayuga and Seneca Canal	$6 00						$0 25	$0 06
Guy Moulton	Black River Canal								
	Total for all canals	$2,060 00	$618 87	$126 00	$1,006 76	$971 75	$360 00	$2,380 87	$2,997 37

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CHAPTER 147, LAWS 1903.

ON WHAT ACCOUNT.	Total.	STATE ENGINEER AND DEPUTIES.		DIVISION ENGINEER.	
		Services.	Travel.	Services.	Travel.
Erie Canal, Eastern Division (Head Office)	$78,779 61	$1,609 99	$83 13	....	....
Erie Canal, Eastern Division	198,125 03	....	....	$233 34	$476 85
Total Erie Canal, Eastern Division	$276,904 64	$1,609 99	$83 13	$233 34	$476 85
Erie Canal, Middle Division (Head Office)	$50,644 03	$1,035 00	$53 43	....	....
Erie Canal, Middle Division	105,938 79	....	....	$1,500 00	$291 88
Total Erie Canal, Middle Division	$156,582 82	$1,035 00	$53 43	$1,500 00	$291 88
Erie Canal, Western Division (Head Office)	$95,660 95	$1,954 99	$100 96	....	....
Erie Canal, Western Division	172,020 59	....	....	....	$713 49
Total Erie Canal, Western Division	$267,681 54	$1,954 99	$100 96	....	$713 49
Total Erie Canal, all Divisions	$701,169 00	$4,599 98	$237 52	$1,733 34	$1,482 22
Champlain Canal (Head Office)	$39,389 80	$805 00	$41 57	....	....
Champlain Canal	101,560 21	....	....	$116 66	347 90
Total Champlain Canal	$140,950 01	$805 00	$41 57	$116 66	$347 90
Oswego Canal (Head Office)	$16,881 34	$345 00	$17 81	....	....
Oswego Canal	45,475 47	....	....	$1,500 00	80 46
Total Oswego Canal	$62,356 81	$345 00	$17 81	$1,500 00	$80 46
Total Erie, Champlain and Oswego Canals	$904,475 82	$5,749 98	$296 90	$3,350 00	$1,910 58

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CHAPTER 147, LAWS 1903 — (*Continued*).

ON WHAT ACCOUNT.	RESIDENT ENGINEER.		BRIDGE DESIGNER.		EXPERTS.	
	Services.	Travel.	Services.	Travel.	Services.	Travel.
Erie Canal, Eastern Division (Head Office)	$4,885 34	$284 58	$13,558 47	$101 22	$4,322 34	$250 51
Erie Canal, Eastern Division	13.990 28	1,763 31	1,119 81	153 21		
Total Erie Canal, Eastern Division	$18,875 62	$2.047 89	$14,678 28	$254 43	$4,322 34	$250 51
Erie Canal, Middle Division (Head Office)	$3,140 57	$182 95	$8,716 16	$65 07	$2,778 65	$161 04
Erie Canal, Middle Division	7,986 83	563 00		4 86		
Total Erie Canal, Middle Division	$11,127 40	$745 95	$8,716 16	$69 93	$2,778 65	$161 04
Erie Canal, Western Divison (Head Office)	$5,932 20	$345 56	$16,463 86	$122 92	$5,218 56	$304 18
Erie Canal, Western Division	11.700 00	892 25				
Total Erie Canal, Western Division	$17,632 20	$1,237 81	$16,463 86	$122 92	$5,248 56	$304 18
Total Erie Canal, all Divisions	$47,635 22	$4,031 65	$39,858 30	$447 28	$12,349 55	$715 73
Champlain Canal (Head Office)	$2,442 67	$142 29	$6,779 23	$50 61	$2,161 17	$125 25
Champlain Canal	8,486 29	2,030 02	401 82	111 56		
Total Champlain Canal	$10,928 96	$2,172 31	$7,181 05	$162 17	$2,161 17	$125 25
Oswego Canal (Head Office)	$1,046 86	$60 98	$2,905 39	$21 69	$926 22	$53 68
Oswego Canal	2,625 00	507 02	177 68	6 51		
Total Oswego Canal	$3,671 86	$568 00	$3,083 07	$28 20	$926 22	$53 68
Total Erie, Champlain and Oswego Canals	$62,236 04	$6,771 96	$50,122 42	$637 65	$15,436 94	$894 66

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CHAPTER 147, LAWS 1903 — (*Continued*).

ON WHAT ACCOUNT.	Clerical services.	Draftsman	Assistant engineer.	Leveler.	Rodman.	Chainman.	Inspector.	Labor.
Erie Canal, Eastern Division (Head Office)	$6,800 75	$7,997 32	$13,921 46	$3,392 48	$1,224 72	$1,410 22	$544 04	$3,057 60
Erie Canal, Eastern Division	4,330 49	6,735 29	32,125 00	31,073 50	21,368 50	24,409 50	16,676 00	10,602 00
Total Erie Canal, Eastern Division	$11,131 24	$14,732 61	$46,046 46	$34,465 98	$22,593 22	$25,819 72	$17,220 04	$13,659 60
Erie Canal, Middle Division (Head Office)	$4,371 91	$5,141 13	$8,949 51	$2,180 88	$787 32	$906 57	$349 74	$1,965 60
Erie Canal, Middle Division	2,209 99	4,990 50	24,136 00	15,507 00	11.587 50	6,282 00	3,681 00	8,772 00
Total Erie Canal, Middle Division	$6,581 90	$10,131 63	$33,085 51	$17,687 88	$12,374 82	$7,188 57	$4,030 74	$10,737 60
Erie Canal, Western Division (Head Office)	$8,258 05	$9,711 03	$16,904 63	$4,119 44	$1,487 16	$1,712 41	$660 62	$3,712 80
Erie Canal, Western Division	2,074 32	17,645 77	33,196 00	19,322 00	13,420 00	8,687 50	8,870 50	15,273 00
Total Erie Canal, Western Division	$10,332 37	$27,356 80	$50,100 63	$23,441 44	$14,907 16	$10,399 91	$9,531 12	$18,985 80
Total Erie Canal, all Divisions	$28,045 51	$52,221 04	$129,232 60	$75,595 30	$49,875 20	$43,408 20	$30,781 90	$43,383 00
Champlain Canal (Head Office)	$3,400 38	$3,998 66	$6,960 73	$1,696 24	$612 36	$705 11	$272 02	$1,528 80
Champlain Canal	3,716 90	7,449 00	22,082 50	14,609 50	10,742 00	4,149 00	5,060 50	6,122 00
Total Champlain Canal	$7,117 28	$11,447 66	$29,043 23	$16,305 74	$11,354 36	$4,854 11	$5,332 52	$7,650 80
Oswego Canal (Head Office)	$1,457 30	$1,713 71	$2,983 17	$726 96	$262 44	$302 19	$116 58	$655 20
Oswego Canal	1,017 09	3,633 50	6,162 00	8,456 50	4,694 50	1,898 00	4,184 50	2,937 00
Total Oswego Canal	$2,474 39	$5,347 21	$9,145 17	$9,183 46	$4,956 94	$2,200 19	$4,301 08	$3,592 20
Total Erie, Champlain and Oswego Canals	$37,637 18	$69,015 91	$167,421 00	$101,084 50	$66,186 50	$50,462 50	$40,415 50	$54,626 00

STATEMENT SHOWING THE DISTRIBUTION OF VOUCHERS RENDERED BY DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, CHAPTER 147, LAWS 1903 — (*Concluded*).

ON WHAT ACCOUNT.	Other services.	Other travel.	Instruments, tools and appliances.	Office rent.	Fuel and light.	Stationery and printing.	Postage.	Telephone and telegraph.	Miscellaneous.
Erie Canal, Eastern Division (Head Office)	$3,034 31	$1,525 99	$82 43	$1,341 67	$79 43	$3,088 91	$384 51	$584 59	$5,213 60
Erie Canal, Eastern Division	10,225 00	5,716 24	223 54	1,785 38	560 90	210 27	204 61	1,199 24	12,942 77
Total Erie Canal, Eastern Division	$13,259 31	$7,242 23	$305 97	$3,127 05	$640 33	$3,299 18	$589 12	$1,783 83	$18,156 37
Erie Canal, Middle Division (Head Office)	$1,950 62	$980 99	$52 99	$862 50	$51 07	$1,985 73	$247 19	$375 81	$3,351 60
Erie Canal, Middle Division	7,573 44	3,252 05	311 57	931 67	407 99	124 07	225 96	652 74	4,946 74
Total Erie Canal, Middle Division	$9,524 06	$4,233 04	$364 56	$1,794 17	$459 06	$2,109 80	$473 15	$1,028 55	$8,298 34
Erie Canal, Western Division (Head Office)	$3,684 51	$1,852 99	$100 09	$1,629 17	$96 46	$3,750 81	$466 91	$709 85	$6,330 79
Erie Canal, Western Division	19,012 61	8,205 78	258 97	3,334 37	361 89	433 05	297 22	1,142 82	7,179 05
Total Erie Canal, Western Division	$22,697 12	$10,058 77	$359 06	$4,963 54	$458 35	$4,183 86	$764 13	$1,852 67	$13,509 84
Total Erie Canal, all Divisions	$45,480 49	$21,534 01	$1,029 59	$9,884 76	$1,557 74	$9,592 84	$1,826 40	$4,665 05	$39,964 55
Champlain Canal (Head Office)	$1,517 15	$762 99	$41 22	$670 83	$39 72	$1,544 45	$192 26	$292 29	$2,606 80
Champlain Canal	6,156 97	3,601 75	224 00	851 50	334 96	111 45	140 79	539 90	4,173 24
Total Champlain Canal	$7,674 12	$4,364 74	$265 22	$1,522 33	$374 68	$1,655 90	$333 05	$832 19	$6,780 04
Oswego Canal (Head Office)	$650 21	$327 00	$17 66	$287 50	$17 02	$661 91	$82 39	$125 27	$1,117 20
Oswego Canal	3,050 00	608 99	40 93	925 96	156 77	60 95	89 53	294 33	2,368 25
Total Oswego Canal	$3,700 21	$935 99	$58 59	$1,213 46	$173 79	$722 86	$171 92	$419 60	$3,485 45
Total Erie, Champlain and Oswego Canals	$56,854 82	$26,834 77	$1,353 40	$12,620 55	$2,106 21	$11,971 60	$2,331 37	$5,916 84	$50,230 04

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE CAYUGA AND SENECA BARGE CANAL, CHAPTER 391, LAWS 1909.

ON WHAT ACCOUNT.	Total.	STATE ENGINEER AND DEPUTIES.		DIVISION ENGINEER.	
		Services.	Travel.	Services.	Travel.
Erie Canal, Middle Division	$25,808 71				

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CAYUGA AND SENECA LAKES SURVEY, CHAPTER 433, LAWS 1909.

ON WHAT ACCOUNT.	Total.	STATE ENGINEER AND DEPUTIES.		DIVISION ENGINEER.	
		Services.	Travel.	Services.	Travel.
Erie Canal, Middle Division	$13,833 36			$100 00	

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE CAYUGA AND SENECA BARGE CANAL, CHAPTER 391, LAWS 1909 — (*Continued*).

ON WHAT ACCOUNT.	RESIDENT ENGINEER.		BRIDGE DESIGNER.		EXPERTS.	
	Services.	Travel.	Services.	Travel.	Services.	Travel
Erie Canal. Middle Division	$2,085 00	$74 19	$29 17		$465 00	$55 03

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CAYUGA AND SENECA LAKES SURVEY, CHAPTER 433, LAWS 1909 — (*Continued*).

ON WHAT ACCOUNT.	RESIDENT ENGINEER.		BRIDGE DESIGNER.		EXPERTS.	
	Services.	Travel.	Services.	Travel.	Services.	Travel.
Erie Canal, Middle Division	$154 84	$2 80				

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE CAYUGA AND SENECA BARGE CANAL, CHAPTER 391, LAWS 1909 — (*Continued*).

ON WHAT ACCOUNT.	Clerical services.	Draftsman	Assistant engineer.	Leveler.	Rodman.	Chainman.	Inspector.	Labor.
Erie Canal, Middle Division	$107 53	$64 15	$5,523 50	$2,160 00	$4,298 50	$1,754 00	....	$3,736 00

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CAYUGA AND SENECA LAKES SURVEY, CHAPTER 433, LAWS 1909 — (*Continued*).

ON WHAT ACCOUNT.	Clerical services.	Draftsman.	Assistant engineer.	Leveler.	Rodman.	Chainman.	Inspector.	Labor.
Erie Canal, Middle-Division	....	....	$1,769 00	$742 50	$1,617 00	$1,412 00	....	$4,066 00

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE CAYUGA AND SENECA BARGE CANAL, CHAPTER 391, LAWS 1909 — (*Concluded*).

ON WHAT ACCOUNT	Other services.	Other travel.	Instruments. tools and appliances.	Office rent.	Fuel and light.	Stationery and printing.	Postage.	Telephone and telegraph.	Miscellaneous.
Erie Canal, Middle Division	$2,619 00	$1,515 07	$8 27	$427 68	$10 85	$12 87	$21 39	$44 57	$796 94

STATEMENT SHOWING THE DISTRIBUTION OF THE EXPENDITURES OF THE DIVISION ENGINEERS DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CAYUGA AND SENECA LAKES SURVEY, CHAPTER 433, LAWS 1909 — (*Concluded*).

ON WHAT ACCOUNT.	Other services.	Other travel.	Instruments, tools and appliances.	Office rent.	Stationery and printing.	Fuel and light.	Postage.	Telephone and telegraph.	Miscellaneous.
Erie Canal, Middle Division	$1,102 50	$1,180 89	$2 06	$151 92	$9 97	$8 38	$9 39	$22 91	$1,481 20

CANAL DEBT SINKING FUNDS.

DETAIL OF CASH TRANSACTIONS DURING FISCAL YEAR ENDED SEPTEMBER 30, 1910.

	Under article 7, section 1 of the Constitution.	Under article 7, section 3 of the Constitution.	Under article 7, section 4 of the Constitution, and chapter 79, Laws of 1895.	Under article 7, section 4 of the Constitution, and chapter 147, Laws of 1903.	Under article 7, section 4 of the Constitution, and chapters 147 and 302, Laws of 1903 and 1906.	Under article 7, section 4 of the Constitution, and chapters 147 and 66, Laws of 1903 and 1910.	Under article 7, section 4 of the Constitution, and chapters 391 and 139, Laws of 1909 and 1910.	Total.
Balance in funds, October 1, 1909	$160 00	$500 00	$7,469,044 84	$704,685 66	$12,502,830 57	....	....	$20,677,221 07
Less securities in funds	....	....	4,727,845 93	682,000 00	12,268,815 42	....	....	17,678,661 35
Cash on hand, October 1, 1909	$160 00	$500 00	$2,741,198 91	$22,685 66	$234,015 15	....	....	$2,998,559 72
Received during year.								
Transfer from General Fund, per Chapter 435, Laws of 1909	....	....	....	$231,986 85	$811,953 97	....	....	$1,043,940 82
Premium on sale of New York State Canal Improvement bonds	....	....	....	....	....	$77,462 60	....	77,462 60
Accrued interest on sale of New York State Canal Improvement bonds	....	....	....	....	....	17,101 71	2,333 33	19,435 04
Deposit with bid forfeited	....	....	....	....	....	20 00	....	20 00
Par value of securities, sold or redeemed	....	....	3,230,031 46	....	838,648 51	....	....	4,068,679 97
Premium on securities sold	....	....	26,550 00	....	13,151 10	....	....	39,701 10
Accrued interest on securities sold	....	....	7,666 69	....	3,797 53	....	....	11,464 22
Interest on investments	....	....	198,975 45	23,520 00	467,119 40	....	....	689,614 85
Interest on deposits	....	....	51,216 92	5,261 94	142,389 25	528 61	5,591 44	204,988 16
Receipts during year	....	....	$3,514,440 52	$260,768 79	$2,277,059 76	$95,112 92	$7,924 77	$6,155,306 76

CANAL DEBT SINKING FUNDS —(*Concluded*).

Detail of Cash Transactions During Fiscal Year Ended September 30, 1910.

	Under article 7, section 1 of the Constitution.	Under article 7, section 3 of the Constitution.	Under article 7, section 4 of the Constitution, and chapter 79, Laws of 1895.	Under article 7, section 4 of the Constitution, and chapter 147, Laws of 1903.	Under article 7, section 4 of the Constitution, and chapters 147 and 302, Laws of 1903 and 1906.	Under article 7, section 4 of the Constitution, and chapters 147 and 66, Laws of 1903 and 1910.	Under article 7, section 4 of the Constitution, and chapters 391 and 139, Laws of 1909 and 1910.	Total.
Expenditures during year.								
Interest on debt	....	....	$216,900 00	$60,000 00	$630,000 00	....	....	$906,900 00
Par value of securities purchased	....	....	4,039,587 34	....	743,000 00	....	....	4,782,587 34
Premium on securities purchased	....	....	7,400 00	....	....	....	....	7,400 00
Accrued interest on securities purchased	....	....	8,454 10	....	1,735 89	....	....	10,189 99
Interest on temporary loans	....	....	....	....	....	$4,166 67	$287 20	4,453 87
Expenditures during year	....	....	$4,272,341 44	$60,000 00	$1,374,735 89	$4,166 67	$287 20	$5,711,531 20
Cash on hand September 30, 1910	$160 00	$500 00	$1,983,297 99	$223,454 45	$1,136,339 02	$90,946 25	$7,637 57	$3,442,335 28
Add securities in funds	....	....	5,537,401 81	682,000 00	12,173,166 91	....	....	18,392,568 72
Balance in funds, September 30, 1910	$160 00	$500 00	$7,520,699 80	$905,454 45	$13,309,505 93	$90,946 25	$7,637 57	$21,834,904 00

DETAIL OF INVESTMENT TRANSACTIONS ON ACCOUNT OF CANAL DEBT SINKING FUND UNDER ARTICLE 7, SECTION 4 OF THE CONSTITUTION AND CHAPTER 79 OF THE LAWS OF 1895, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

BONDS.	Rate.	Registered or coupon.	Due.	Par of holdings October 1, 1909.	Purchased during year.	Sold or redeemed during year.	Par of holdings September 30, 1910.	Interest collected during year.	Premium and accrued interest on sales of bonds during year.	Premium and accrued interest on purchases of bonds during year.
State:										
Comptroller's temporary certificates for improvement of Erie, Champlain and Oswego					$1,500,000 00	$1,500,000 00		$4,166 67		
Comptroller's temporary certificates for improvement of Cayuga and Seneca					20,000 00	20,000 00		287 20		
Canal improvement	3 %	C	Jan. 1, 1923	$250,000 00			$250,000 00	7,500 00		
Canal improvement	4 %	C	July 1, 1960		1,500,000 00	1,500,000 00			$34,216 69	$3,500 00
Counties.										
New York	3 3/10 %	R	July 1, 1918	50,000 00			50,000 00	1,650 00		
Rensselaer	3½%	R	April 1, 1937–1939	21,000 00			21,000 00	735 00		
Westchester	4 %	R	June 1, 1911–1913	25,000 00			25,000 00	1,000 00		
Westchester	4 %	R	June 1, 1915	20,000 00			20,000 00	800 00		
Cities:										
Buffalo	3½%	R	Dec. 1, 1909–1917	24,750 00		2,750 00	22,000 00	818 12		
Buffalo	3½%	R	Nov. 1, 1909–1918	50,000 00		5,000 00	45,000 00	1,662 50		
Buffalo	3½%	R	May 2, 1910–1918	22,500 00		2,500 00	20,000 00	787 50		
Buffalo	3½%	R	April 1, 1918	60,000 00			60,000 00	2,100 00		
Buffalo	3½%	R	Mar. 1, 1910–1919	50,000 00		5,000 00	45,000 00	1,662 50		
Buffalo	3½%	R	June 1, 1919	85,187 18			85,187 18	2,981 54		
Buffalo	3½%	R	July 1, 1919	47,715 96			47,715 96	1,670 05		
Buffalo	3½%	R	Oct. 2, 1919	35,455 35			35,455 35	1,240 94		
Buffalo	3½%	R	April 1, 1921	111,544 18			111,544 18	3,904 05		
Geneva	3½%	R	April 1, 1910–1919	25,000 00		2,500 00	22,500 00	875 00		
Hornellsville	3½%	C	Feb. 1, 1910–1921	79,500 00		6,500 00	73,000 00	2,668 75		
Little Falls	3½%	R	July 1, 1910–1935	51,000 00		2,000 00	49,000 00	1,785 00		
New York	4 %	R	June 1, 1914	10,000 00			10,000 00	400 00		
New York	3 %	R	May 1, 1915	10,000 00			10,000 00	300 00		
New York	3 %	R	Jan. 1, 1918	20,000 00			20,000 00	600 00		
New York	3 %	R	Nov. 1, 1920	10,000 00			10,000 00	300 00		
New York	3½%	R	Oct. 1, 1921	18,000 00			18,000 00	630 00		
New York	3 %	R	Nov. 1, 1921	15,000 00			15,000 00	450 00		
New York	3½%	R	Nov. 1, 1922	35,000 00			35,000 00	1,225 00		
New York	3 %	R	Nov. 1, 1923	20,000 00			20,000 00	600 00		
New York	3½%	R	Jan. 1, 1925	200,000 00			200,000 00	7,000 00		
New York	3 %	R	Nov. 1, 1925	6,000 00			6,000 00	180 00		
New York	3½%	R	Nov. 1, 1928	50,000 00			50,000 00	1,750 00		
New York	3½%	R	Nov. 1, 1929	73,000 00			73,000 00	2,555 00		

DETAIL OF INVESTMENT TRANSACTIONS, ETC.— (*Concluded*).

BONDS.	Rate.	Registered or coupon	Due.	Par of holdings October 1, 1909.	Purchased during year.	Sold or redeemed during year.	Par of holdings September 30, 1910.	Interest collected during year.	Premium and accrued interest on sales of bonds during year.	Premium and accrued interest on purchase of bonds during year.
Cities, Continued										
New York	4 %	R	Nov. 1, 1936	$500,000 00			$500,000 00	$20,000 00		
New York	3½%	R	Oct. 1, 1952	500,000 00			500,000 00	17,500 00		
New York	3½%	R	Nov. 1, 1952	500,000 00			500,000 00	17,500 00		
New York	3½%	R	Nov. 1, 1954	200,000 00			200,000 00	7,000 00		
New York	4 %	R	Nov. 1, 1955	810,000 00			810,000 00	32,400 00		
New York	4 %	R	May 1, 1959		$1,000,000 00		1,000,000 00	20,000 00		$12,288 88
Niagara Falls	4 %	R	May 1, 1919	15,000 00			15,000 00	600 00		
Rome	4 %	R	Feb. 1, 1910-1918	29,250 00		$3,250 00	26,000 00	1,105 00		
Syracuse	3½%	R	April 1, 1910-1921	60,000 00		5,000 00	55,000 00	2,100 00		
Syracuse	3½%	R	Aug. 1, 1910-1921	8,400 00		700 00	7,700 00	294 00		
Syracuse	3½%	R	July 1, 1910-1918	55,800 00		6,200 00	49,600 00	1,953 00		
Troy	3½%	R	Aug. 15, 1910-1912	7,000 00		2,000 00	5,000 00	245 00		
Utica	4 %	R	Jan. 1, 1910-1919	30,000 00		3,000 00	27,000 00	1,200 00		
Watervliet	3½%	R	Aug. 1, 1910-1934	25,000 00		1,000 00	24,000 00	875 00		
Towns:										
Alfred	3½%	R	Feb. 1, 1910-1911	2,000 00		1,000 00	1,000 00	52 50		
Bainbridge	3½%	R	Jan. 1, 1910-1923	14,000 00		1,000 00	13,000 00	472 50		
Kirkland	4 %	C	Jan. 15, 1910-1911	1,000 00		500 00	500 00	40 00		
Rotterdam	5 %	C	Aug. 1, 1910	500 00		500 00		25 00		
Scio	4½%	C	Dec. 1, 1909-1914	6,000 00		1,000 00	5,000 00	270 00		
Wayne	3½%	R	Jan. 1, 1910-1920	21,000 00		1,000 00	20,000 00	717 50		
West Seneca	4 %	R	Jan. 1, 1910-1920	11,000 00		1,000 00	10,000 00	420 00		
Villages:										
Alden	3½%	C	Sept. 1, 1910-1922	11,700 00		900 00	10,800 00	409 68		
Brockport	$3\frac{65}{100}$	R	Aug. 1, 1910-1931	66,000 00		3,000 00	63,000 00	2,409 00		
Corinth	3½%	C	Aug. 1, 1910-1927	36,000 00		2,000 00	34,000 00	1,260 00		
East Aurora	4 %	R	Jan. 1, 1911	50,000 00			50,000 00	2,000 00		
Hamilton	4 %	C	Oct. 15, 1904-1924*	25,000 00			25,000 00	1,000 00		
Hamilton	4 %	C	April 15, 1925	10,000 00			10,000 00	400 00		
Lansingburgh	4 %	C	Aug. 1, 1949	60,000 00			60,000 00	2,400 00		
Malone	4¾%	R	May 15,1910	100,000 00		100,000 00		4,750 00		
Mohawk	4 %	C	Oct. 1, 1910	25,000 00			25,000 00	1,000 00		
Nassau	3½%	R	Nov. 10, 1909-1922	10,500 00		750 00	9,750 00	354 38		
Otego	3½%	R	June 11, 1910-1930	12,600 00		600 00	12,000 00	441 00		
Salamanca	3½%	R	July 1, 1910-1920	6,600 00		600 00	6,000 00	231 00		
Salamanca	3½%	R	July 1, 1910-1920	12,697 52		1,154 32	11,543 20	444 41		
Judgments of the Court of Claims	6 %	R	Var. 1910-1911	30,145 74	19,587 34	47,627 14	2,105 94	2,821 66		65 22
Total				$4,727,845 93	$4,039,587 34	$3,230,031 46	$5,537,401 81	$198,975 45	$34,216 69	$15,854 10

* Optional.

DETAIL OF INVESTMENT TRANSACTIONS ON ACCOUNT OF CANAL DEBT SINKING FUND UNDER ARTICLE 7, SECTION 4 OF THE CONSTITUTION AND CHAPTER 147 OF THE LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

BONDS.	Rate.	Registered or coupon.	Due.	Par of holdings Oct. 1, 1909.	Purchased during year.	Sold or redeemed during year.	Par of holdings Sept. 30, 1910.	Interest collected during year.
Cities:								
New York	3½%	R	Nov. 1, 1928	$115,000 00	....	....	$115,000 00	$4,025 00
New York	3½%	R	Nov. 1, 1940	30,000 00	....	....	30,000 00	1,050 00
New York	3½%	R	Nov. 1, 1951	48,000 00	....	....	48,000 00	1,680 00
New York	3½%	R	Oct. 1, 1952	20,000 00	....	....	20,000 00	350 00
New York	3½%	R	Nov. 1, 1952	145,000 00	....	....	145,000 00	5,075 00
New York	3½%	R	Nov. 1, 1953	25,000 00	....	....	25,000 00	875 00
New York	3½%	R	May 1, 1954	128,000 00	....	....	128,000 00	4,480 00
New York	3½%	R	Nov. 1, 1954	136,000 00	....	....	136,000 00	4,760 00
New York	3½%	R	Nov. 1, 1955	35,000 00	....	....	35,000 00	1,225 00
Total	.....	....	....	$682,000 00	....	....	$682,000 00	$23,520 00

DETAIL OF INVESTMENT TRANSACTIONS ON ACCOUNT OF CANAL DEBT SINKING FUND UNDER ARTICLE 7, SECTION 4 OF THE CONSTITUTION AND CHAPTERS 147 AND 302 OF THE LAWS OF 1903 AND 1906 FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

BONDS.	Rate.	Registered or coupon.	Due.	Par of holdings October 1, 1909.	Purchased during year.	Sold or redeemed during year.	Par of holdings September 30, 1910.	Interest collected during year.	Premium and accrued interest on sales of bonds during year.	Accrued interest on purchases of bonds during year.
State:										
Canal Improvement	4 %	C	Jan. 1, 1960		$743,000 00	$743,000 00			$16,948 63	$1,735 89
Counties:										
Chemung	4½%	C	Feb. 1, 1910-1919	$60,760 88		22,760 88	$38,000 00	$2,222 12		
Onondaga	4 %	R	Jan. 1, 1934	35,000 00			35,000 00	1,400 00		
Cities:										
Albany	4 %	R	Mar. 1, 1910-1929	102,000 00		5,500 00	96,500 00	3,970 00		
Buffalo	4 %	R	Oct. 1, 1909-1928	79,382 00		3,969 10	75,412 90	3,095 89		
Buffalo	4 %	R	Oct. 1, 1909-1913	173,168 53		23,168 53	150,000 00	6.463 37		
Buffalo	4 %	R	Oct. 10, 1928, 1958§	350,000 00			350,000 00	14,000 00		
New York	3 %	R	Oct. 1, 1913, 1933§	25,000 00			25,000 00	750 00		
New York	3½%	R	Oct. 1, 1920	6,000 00			6,000 00	210 00		
New York	3½%	R	Nov. 1, 1920	4,000 00			4,000 00	140 00		
New York	3½%	R	Jan. 1, 1925	1,000 00			1,000 00	35 00		
New York	3½%	R	Jan. 1, 1926	12,000 00			12,000 00	420 00		
New York	3½%	R	Nov. 1, 1927	12,000 00			12,000 00	420 00		
New York	3½%	R	Nov. 1, 1928	810,600 00			810,600 00	28,371 00		
New York	3½%	R	Nov. 1, 1929	2,211,000 00			2,211,000 00	77,385 00		
New York	3½%	R	Jan. 1, 1935	58,000 00			58,000 00	2,030 00		
New York	3½%	R	Jan. 1, 1937	5,000 00			5,000 00	175 00		
New York	3½%	R	Nov. 1, 1940	418,000 00			418,000 00	14,630 00		
New York	3½%	R	Nov. 1, 1941	152,000 00			152,000 00	5,320 00		
New York	3½%	R	Nov. 1, 1942	26,000 00			26.000 00	910 00		
New York	3½%	R	Nov. 1, 1950	7,000 00			7,000 00	245 00		
New York	3½%	R	Oct. 1, 1952	67,000 00			67,000 00	2,345 00		
New York	3½%	R	Nov. 1, 1952	191,000 00			191,000 00	6,685 00		
New York	3½%	R	Nov. 1, 1953	301,000 00			301,000 00	10,535 00		
New York	3½%	R	April 1, 1954	55,000 00			55,000 00	1,925 00		
New York	3½%	R	May 1, 1954	170,000 00			170,000 00	5,950 00		

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§ Optional.

STATEMENT OF INVESTMENT TRANSACTIONS, ETC.—(*Concluded*).

BONDS.	Rate.	Registered or coupon.	Due.	Par of holdings October 1, 1909.	Purchased during year.	Sold or redeemed during year.	Par of holdings September 30, 1910.	Interest collected during year.	Premium and accrued interest on sales of bonds during year.	Accrued interest on purchases of bonds during year.
New York	3½%	R	Nov. 1, 1954	$364,000 00			$364,000 00	$12,740 00		
New York	3½%	R	Nov. 1, 1955	107,000 00			107,000 00	3,745 00		
New York	4 %	R	Nov. 1, 1955	20,000 00			20,000 00	800 00		
New York	4 %	R	Nov. 1, 1956	150,000 00			150,000 00	6,000 00		
New York	4 %	R	May 1, 1957	128,000 00			128,000 00	5,120 00		
New York	4½%	R	May 1, 1957	94,000 00			94,000 00	4,230 00		
New York	4½%	R	Nov. 1, 1957	859,000 00			859,000 00	38,655 00		
New York	4 %	R	Nov. 1, 1958	3,075,000 00			3,075,000 00	123,000 00		
New York	4 %	R	May 1, 1959	1,253,000 00			1,253,000 00	45,108 00		
Oswego	4½%	R	June 1, 1910-1912	29,000 00		$13,500 00	15,500 00	1,305 00		
Rochester	4 %	R	Sept. 1, 1918-1938§	100,000 00			100,000 00	4,000 00		
Schenectady	4½%	R	July 15, 1910-1928	332,000 00		18,000 00	314,000 00	14,940 00		
Utica	4½%	R	July 15, 1910-1928	47,500 00		2,500 00	45,000 00	2,137 50		
Utica	4½%	R	Aug. 7, 1911-1913	15,654 01			15,654 01	704 44		
Watertown	4 %	R	May 1, 1938	100,000 00			100,000 00	4,000 00		
Yonkers	4½%	R	Sept. 1, 1910-1928	118,750 00		6,250 00	112,500 00	5,343 75		
Towns:										
Boonville	4 %	R	Nov. 1, 1910-1939	40,000 00			40,000 00	1,333 33		
Pomfret	4 %	R	Jan. 1, 1912-1935	24,000 00			24,000 00	960 00		
Villages:										
Briarcliff Manor	4¼%	C	July 10, 1913-1927	45,000 00			45,000 00	1,912 50		
Peekskill	$4\frac{15}{100}$	R	Oct. 1, 1938	35,000 00			35,000 00	1,452 50		
Total				$12,268,815 42	$743,000 00	$838,648 51	$12,173,166 91	$467,119 40	$16,948 63	$1,735 89

§ Optional.

CANAL CONSTRUCTION FUNDS.

Transactions During Fiscal Year Ended September 30, 1910.

	Construction Erie, Champlain and Oswego, Chapter 147, Laws of 1903.	Construction Cayuga and Seneca, Chapter 391, Laws of 1909.	Survey from Seneca river to Cayuga lake, Chapter 709, Laws of 1905.	Surveys Cayuga and Seneca lakes.	Total.
Cash in bank October 1, 1909	$6,391,361 87		$455 07		$6,391,816 94
Cash in hands of Division Engineers, unexpended, October 1, 1909	22,658 37			$733 36	23,391 73
Balance in funds October 1, 1909	$6,414,020 24		$455 07	$733 36	$6,415,208 67
Received During Year.					
Tansferred from General Fund on account of appropriations				$20,000 00	$20,000 00
Transfer from Fund for Survey from Seneca River to Cayuga Lake, per Chapter 513, Laws of 1910		$455 07			455 07
Par value of bonds sold	$10,000,000 00	1,000,000 00			11,000,000 00
Par value of Comptroller's temporary certificates issued	1,500,000 00	20,000 00			1,520,000 00
Miscellaneous Receipts.					
Erie Canal	6,104 28				6,104 28
Champlain Canal	63 75				63 75
	$11,506,168 03	$1,020,455 07		$20,000 00	$12,546,623 10
Vouchers Rendered During Year.					
Transferred to Fund for Ordinary Repairs in repayment of advance				$6,900 00	$6,900 00
Transferred to Fund for Construction of Cayuga and Seneca Barge Canal			$455 07		455 07
Par value of Comptroller's temporary certificates redeemed	$1,500,000 00	$20,000 00			1,520,000 00
On account of construction of:					
Erie Canal	7,450,030 40				7,450,030 40
Champlain Canal	1,379,586 63				1,379,586 63
Oswego Canal	536,015 52				536,015 52
Cayuga and Seneca Canal		26,938 02		13,833 36	40,771 38
	$10,865,632 55	$46,938 02	$455 07	$20,733 36	$10,933,759 00
Cash in bank September 30, 1910	$7,042,061 90	$970,325 76			$8,012,387 66
Cash in hands of Division Engineers, unexpended, September 30, 1910	12,493 82	3,191 29			15,685 11
Balance in funds September 30, 1910	$7,054,555 72	$973,517 05			$8,028,072 77

CANAL REPAIR FUNDS.

Transactions During Fiscal Year Ended September 30, 1910.

	Fund for ordinary repairs.	Fund for extraordinary repairs.	Total.
Cash in bank, October 1, 1909	$1,194,048 29	$140,587 61	$1,334,635 90
Cash in hands of Superintendent of Public Works and division engineers, unexpended October 1, 1909	2,859 94	487 69	3,347 63
Balance in funds, October 1, 1909	$1,196,908 23	$141,075 30	$1,337,983 53
Received During Year.			
Transferred from General Fund on account of appropriations	$1,125,498 42	$146,500 00	$1,271,998 42
Transferred from Fund for Surveys Cayuga and Seneca lakes in repayment of advance	6,900 00	....	6,900 00
Interest on deposits	48,131 66	6,218 37	54,350 03
Miscellaneous Receipts.			
Erie canal	38,176 41	....	38,176 41
Champlain canal	1,060 00	....	1,060 00
Oswego canal	....	475 00	475 00
Black River canal	32 10	....	32 10
	$1,219,798 59	$153,193 37	$1,372,991 96
Vouchers rendered during year:			
Erie and Champlain canals	$1,117,241 02	$56,353 89	$1,173,594 91
Oswego canal	22,915 35	....	22,915 35
Cayuga and Seneca canal	28,911 02	....	28,911 02
Black River canal	52,536 68	52,934 96	105,471 64
Chemung canal	....	586 45	586 45
	$1,221,604 07	$109,875 30	$1,331,479 37
Cash in bank September 30, 1910	$1,191,568 08	$183,187 30	$1,374,755 38
Cash in hands of Superintendent of Public Works and Division Engineers unexpended September 30, 1910	3,534 67	1,206 07	4,740 74
Balance in funds September 30, 1910	$1,195,102 75	$184,393 37	$1,379,496 12

FUND OF THE ERIE AND CHAMPLAIN CANALS.

Received, viz.:

On account of ordinary repairs:

Erie canal:

Sale of ice	$1,510 20
Sale of stone	591 80
Sale of lumber	31 80
Fees of Bureau of Canal Affairs	99 15
Fees of Superintendent of Public Works, filing mortgages and liens on canal boats	16 38
Carried forward	$2,249 33

Brought forward	$2,249 33	
Rental of State land	300 00	
Damages recovered by Attorney-General against city of Syracuse	35,060 00	
Collection of penalties	226 35	
Collection at sloop lock at Buffalo.	12 50	
Rent of surplus water	10 00	
Refund by Superintendent of Public Works	61 92	
Raising sunken boat	72 50	
Use of dredge	115 90	
Use of pump boat	12 46	
Towing boats	37 45	
Services of boat crew	18 00	
		$38,176 41
Champlain canal:		
Rent of surplus water	$760 00	
Sale of building	300 00	
		1,060 00
On account of construction of the Erie, Champlain and Oswego canals:		
Erie canal:		
Sale of structures on Barge canal route	$1,575 00	
Miscellaneous receipts	4,529 28	
		6,104 28
Champlain canal:		
Miscellaneous receipts		63 75
Transferred from sundry accounts:		
Fund for ordinary repairs		1,117,241 02
Fund for extraordinary repairs		56,353 89
Fund for the construction of the Erie, Champlain and Oswego canals		8,829,617 03
		$10,048,616 38

Paid, viz.:		
General (chargeable as ordinary repairs):		
To Frank M. Williams, State Engineer and Surveyor, for traveling expenses	$2,000 00	
Harry W. DeGraff, Deputy State Engineer and Surveyor, for traveling expenses	640 04	
To salary and travel of Superintendents of Public Works and Assistants:		
Frederick C. Stevens, Superintendent, salary	6,000 00	
Frederick C. Stevens, Superintendent, travel	182 15	
Winslow M. Mead, Deputy Superintendent, salary	5,000 00	
Winslow M. Mead, Deputy Superintendent, travel.	691 02	
David H. Lewis, Assistant Superintendent, salary	3,000 00	
David H. Lewis, Assistant Superintendent, travel	476 05	
Charles C. Barrett, Assistant Superintendent, salary	3,000 00	
Charles C. Barrett, Assistant Superintendent, travel	355 25	
Henry A. Kunze, Assistant Superintendent, salary	3,000 00	
Henry A. Kunze, Assistant Superintendent, travel	498 61	
		$24,843 12
Carried forward		$24,843 12

Brought forward		$24,843 12
For clerk hire and office expenses, etc., Superintendent's office, Albany:		
Patrick J. McWeeney, financial clerk	$3,600 00	
Edward L. Walsh, assistant financial clerk	2,700 00	
Victor B. Deyber, private secretary	1,200 00	
Frank S. Harder, stenographer	1,300 00	
Alfred M. O'Neill, stenographer	2,000 00	
Jessie E. Holmes, stenographer	1,000 00	
Mary E. Kirker, stenographer	900 00	
Dudley D. N. Marvin, special agent	1,200 00	
Frank Langwig, messenger	1,200 00	
F. Marsden, temporary clerk	187 50	
Etta C. Shortsleeves, temporary stenographer	218 44	
Mary E. Heeran, temporary stenographer	34 84	
Stationery and printing	2,501 60	
Telephone, telegraph and messenger service	801 63	
Postage, box rent, etc.	630 10	
Furniture, fixtures and office supplies	35 60	
Express and freight	231 81	
Newspapers, newspaper clippings and directory	206 50	
Drinking water	28 00	
Travel	53 04	
Legislative index	50 00	
Painting office	90 00	
Miscellaneous	21 19	
		20,190 25
Carried forward		$45,033 37

Brought forward		$45,033 37
Assistant Superintendent's office, Eastern Division:		
William H. Bradt, clerk	$1,600 00	
Elbert L. Kemp, stenographer	900 00	
Telephone, telegraph and messenger service	520 12	
Postage	80 00	
Office supplies	10 50	
		3,110 62
Assistant Superintendent's office, Middle Division:		
Frank J. Kniskern, clerk	$1,800 00	
Lottie M. Howe, assistant clerk	1,000 00	
Katherine B. Allis, stenographer	900 00	
Ama Bluestone, temporary stenographer	27 69	
Telephone, telegraph and messenger service	529 18	
Water, heat, light, etc	166 71	
Postage	168 00	
Stationery, directory, etc	126 21	
Towel service	24 00	
Paper boxes	2 40	
		4,744 19
Assistant Superintendent's office, Western Division:		
Michael Claffey, clerk	$1,500 00	
Mabel C. Keehn, assistant clerk	1,200 00	
Howard G. Nobles, stenographer	900 00	
Elina Ferguson, janitress	144 00	
Telephone, telegraph and messenger service	521 14	
Postage and box rent	121 00	
Stationery, directory, etc	100 39	
Carried forward	$4,486 53	$52,888 18

Brought forward	$4,486 53	$52,888 18
Office supplies	77 01	
Fuel, etc.	18 60	
		4,582 14
For clerk hire and office expenses, Bureau of Canal Affairs:		
William G. Shaible, chief clerk	$3,000 00	
Thomas W. Cantwell, clerk	1,800 00	
Edward B. Jones, clerk	1,500 00	
Louis J. Flanagan, stenographer	1,200 00	
Patrick H. White, watchman	365 00	
George B. Van Wie, temporary watchman	22 00	
Michael Stern, transfer agent	750 00	
Bank of Manhattan Co., New York, keeping transfer office	2,125 00	
Stationery for transfer office	136 75	
J. B. Lyon Co., printing	1,211 72	
The Journal Company, advertising proceedings of the Canal Board	319 78	
Travel, etc	101 37	
Filing cases	71 25	
Engrossing resolution of Canal Board	35 00	
Framing resolution of Canal Board	3 00	
Gas mantels, etc.	7 30	
Subscription to financial paper	10 00	
Binding financial papers	7 10	
Drinking water	4 00	
Repairs to typewriter	4 00	
Postage	1 98	
Recording deed	1 50	
		12,676 75
Carried forward		$70,147 07

Brought forward		$70,147 07
Miscellaneous:		
Joseph M. Meatyard, for the prosecution of canal cases in accordance with the provisions of the Consolidated Canal Law		512 29
Erie canal:		
On account of maintenance and ordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens...........	$802,865 64	
To Section Superintendents for salaries:		
Jacob M. Grass, Section 1.......	1,500 00	
James Scanlon, Section 2........	1,500 00	
Oliver Hurst, Section 3..........	1,500 00	
Charles Wallace, Section 4......	1,500 00	
Daniel F. Breitenstein, Section 5.	1,500 00	
Elmer J. Clark, Section 6......	1,500 00	
Albert B. Hallett, Section 7.....	1,500 00	
Richard A. Vandeboget, Section 8	1,500 00	
Jacob Allmeroth, Section 9......	1,500 00	
Charles L. Papworth, Section 10.	1,500 00	
William J. Hingston, Section 11.	2,000 00	
To Division Engineers:		
George D. Williams, Eastern Division	7,992 28	
Guy Moulton, Middle Division. .	8,871 70	
Thomas W. Barrally, Western Division	10,204 53	
For making surveys and maps for use before the Court of Claims (chargeable as ordinary repairs):		
George D. Williams, Eastern Division	711 39	
Guy Moulton, Middle Division. . .	2,033 20	
Carried forward	$849,678 74	$70,659 36

Brought forward	$849,678 74	$70,659 36
Thomas W. Barrally, Western Division	271 82	
For mapping canal lands (chargeable as ordinary repairs):		
George D. Williams, Eastern Division	2,323 69	
For services, expenses and witness fees in collecting evidence in defense of claims before the Court of Claims (chargeable as ordinary repairs):		
Matthew A. Heeran, agent	11,118 71	
To sundry persons for judgments of the Court of Claims (chargeable as ordinary repairs):		
Amount of judgments	40,837 09	
Interest on same	2,447 71	
To collecting statistics:		
For office of Superintendent of Public Works and miscellaneous payments	2,652 53	
Collector's office, Albany	642 86	
Collector's office, West Troy	1,272 07	
Collector's office, Rome	525 23	
Collector's office, Syracuse	1,471 85	
Collector's office, Rochester	1,468 72	
Collector's office, Tonawanda	1,069 40	
Collector's office, Buffalo	1,893 11	
Total for maintenance and ordinary repairs of the Erie canal		917,673 53
Carried forward		$988,332 89

Brought forward		$988,332 89
On account of extraordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens	$38,088 27	
To Division Engineers:		
Guy Moulton, Middle Division	4,450 80	
Thomas W. Barrally, Western Division	1,795 06	
To Canal Terminal Commission:		
Expenses of Commission	12,019 76	
Total for extraordinary repairs of the Erie canal		56,353 89
On account of the construction of the Erie canal, chapter 147, Laws of 1903:		
To Superintendent of Public Works:		
Frederick C. Stevens	$6,082,298 03	
To Division Engineers:		
George D. Williams, Eastern Division	423,209 62	
Guy Moulton, Middle Division	105,938 79	
Thomas W. Barrally, Western Division	172,020 59	
Salaries and expenses of Advisory Board of Consulting Engineers	33,331 90	
Salary and expenses of Special Examiner and Appraiser	5,810 51	
Damages	600,356 65	
Advertising sale of bonds	1,614 63	
Preparing bonds	5,191 54	
Carried forward	$7,429,772 26	$1,044,686 78

Brought forward	$7,429,772 26	$1,044,686 78
Investigating claims, witness fees, etc.	12,66[illegible] 77	
Clerical services	2,96[illegible]	
Recording deeds of lands taken	9[illegible] 53	
Damages to contractors	4,463 92	
Miscellaneous payments	72 92	
Total for construction of the Erie cana[illegible]		[illegible]
Champlain canal:		
On account of maintenance and ordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens	$110,35[illegible]	
To Section Superintendents for salaries:		
John Richmond, Section 1	1,5[illegible]	
Patrick O'Grady, Section 2	1,5[illegible]	
George Neddo, Section 3	1,500 0[illegible]	
To Division Engineer:		
George D. Williams, Eastern Division	4,0[illegible]	
To sundry persons for judgments of the Court of Claims (chargeable as ordinary repairs):		
Amount of judgments	7,65[illegible]	
Interest on same	3[illegible]	
To collecting statistics:		
Collector's office, Waterford	5[illegible]	
Collector's office, Whitehall	1,5[illegible]	
Total for maintenance and ordinary r[illegible] of the Champlain canal		128,908 13
Carried forward		[illegible]

Brought forward $8,623,625 31

On account of the construction
of the C ain canal, chap-
ter 147, Law of 1903:
To Superintendent of Public
Works:

Stevens $1,067,262 81
Guy Moulton, M
Thomas W. Barr gineer:
Division .... ns, Eastern Di-
To Canal Term 140,950 01
sion: ses of Advisory
Expenses of Commi ting Engineers. 5,833 07
ses of Special
Total f Appraiser..... 1,016 83
canal 160,842 95
On account of the f bonds....... 282 56
of the Erie ca 908 52
147, Laws of 190 , witness fees,
To Superinte 1,927 84
Works: 518 00
Frederick C. Steven lands taken.. 31 28
To Division Engin ents 12 76
George D. Williams,
vision .... truction of the Champlain
Guy Moulton, Middl 1,379,586 63
Thomas W. Barrally. ndry funds and miscellaneous
vision .... iscal year:
Salaries and expense repairs.................. 39,236 41
Board of Consultin ction of the Erie, Champlain
Salary and expense nals..................... 6,168 03
Examiner and Ap
Damages $10,048,616 38

3

Carried fo

Fund of the Oswego Canal.

Received, viz.:		
On account of extraordinary repairs........		$475 00
Transferred from sundry accounts:		
Fund for ordinary repairs..................		22,915 35
Fund for the construction of the Erie, Champlain and Oswego canals......................		536,015 52
		$559,405 87
Paid, viz.:		
On account of maintenance and ordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens..........	$18,779 64	
To Section Superintendent for salary:		
David S. Burleigh............	1,500 00	
To sundry persons for judgment of the Court of Claims (chargeable as ordinary repairs):		
Amount of judgments	2,017 74	
Interest on same..............	17 97	
To collecting statistics:		
Collector's office, Oswego	600 00	
Total for maintenance and ordinary repairs of the Oswego canal		$22,915 35
On account of the construction of Oswego canal, chapter 147, Laws of 1903:		
To Superintendent of Public Works:		
Frederick C. Stevens..........	$427,475 08	
Carried forward	$427,475 08	$22,915 35

Brought forward	$427,475 08	$22,915 35
To Division Engineers:		
George D. Williams, Eastern Division	16,881 34	
Guy Moulton, Middle Division	45,475 47	
Salary and expenses of Advisory Board of Consulting Engineers	2,499 89	
Salary and expenses of Special Examiner and Appraiser	435 80	
Damages	16,089 65	
Advertising sale of bonds	121 10	
Preparing bonds	389 37	
Investigating claims, witness fees, etc.	26,346 30	
Clerical services	222 00	
Recording deeds of lands taken	8 45	
Miscellaneous payments	71 07	
Total for construction of the Oswego canal		536,015 52
Transferred to the fund for extraordinary repairs the miscellaneous receipts for the fiscal year		475 00
		$559,405 87

FUND OF THE CAYUGA AND SENECA CANAL.

Received, viz.:	
Transferred from sundry accounts:	
Fund for ordinary repairs	$28,911 02
Fund for survey of Cayuga and Seneca lakes	13,833 36
Fund for construction of Cayuga and Seneca Barge canal	26,938 02
	$69,682 40

Paid, viz.:		
On account of maintenance and ordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens..........	$27,351 12	
To Division Engineer:		
Guy Moulton, Middle Division..	59 90	
To Section Superintendent for salary:		
Oliver E. Emens..............	1,500 00	
Total for maintenance and ordinary repairs of the Cayuga and Seneca canal........		$28,911 02
On account of survey of Cayuga and Seneca lakes:		
To Division Engineer:		
Guy Moulton, Middle Division..............		13,833 36
On account of the construction of the Cayuga and Seneca Barge canal, chapter 391, Laws of 1909:		
To Division Engineer:		
Guy Moulton, Middle Division..	$25,808 71	
Advertising sale of bonds.......	199 31	
Preparing bonds	930 00	
Total for construction of the Cayuga and Senca Barge canal		26,938 02
		$69,682 40

Fund of the Black River Canal.

Received, viz.:		
On account of ordinary repairs:		$32 10
Transferred from sundry accounts:		
Fund for ordinary repairs		52,536 68
Fund for extraordinary repairs		52,934 96
		$105,503 74
Paid, viz.:		
On account of maintenance and ordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens	$49,839 08	
To Division Engineer:		
Guy Moulton, Middle Division	68 40	
To Section Superintendent for salary:		
Jerry A. Fiske	1,500 00	
To sundry persons for judgments of the Court of Claims (chargeable as ordinary repairs):		
Amount of judgments	648 00	
Interest on same	37 10	
To collecting statistics:		
Collector's office, Oswego	444 10	
Total for maintenance and ordinary repairs of the Oswego canal		$52,536 68
Carried forward		$52,536 68

Brought forward		$52,536 68
On account of extraordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens	$52,934 96	
Total for extraordinary repairs		52,934 96
Transferred to the fund for ordinary repairs the miscellaneous receipts for the fiscal year		32 10
		$105,503 74

Fund of the Chemung Canal.

Received, viz.:	
Transferred from fund for extraordinary repairs	$586 45

Paid, viz.:		
On account of extraordinary repairs:		
To Superintendent of Public Works:		
Frederick C. Stevens	$586 45	
Total for extraordinary repairs		$586 45

Extraordinary Repairs — Special Appropriations.

Statement of Vouchers Rendered During the Fiscal Year Ended September 30, 1910.

ERIE CANAL — GENERAL.

Barge Canal Terminal Commission:

(Chapter 438, Laws of 1909, and chapter 213, Laws of 1910.)

Salary of secretary	$2,600 00
Expenses of secretary	590 57
Services of engineer, rodman and assistants	1,519 00
Carried forward	$4,709 57

Brought forward	$4,709 57	
Expenses of engineer, rodman and assistants	532 59	
Stenographic services	594 60	
Stationery and printing	214 67	
Postage	95 00	
Desk	30 00	
Expenses of commission to Europe to investigate terminals per chapter 213, Laws of 1910	5,843 33	
		$12,019 76

ERIE CANAL — SECTION 4.

Cleaning out Steel creek in the village of Ilion and constructing a retaining wall for same between the Armory dam and State dam in said village:

(Chapter 578, Laws of 1907, and Chapter 187, Laws of 1909.)

Material, supplies and incidental expenses	20 43

ERIE CANAL — SECTION 5.

Constructing a lift or hoist bridge over the Erie canal at Seneca street, Utica:

(Chapter 454, Laws of 1909.)

Engineering	$1,684 65	
Advertising for bids	81 00	
Inspection	1,191 66	
N. D. Peters Company, contractors	11,318 00	
		14,275 31

(In addition to the above there was paid by Frederick C. Stevens, Superintendent of Public Works, to N. D. Peters Company, contractors, the sum of $4,000 from funds deposited by the city of Utica.)

Carried forward	$26,315 50

Brought forward		$26,315 50

ERIE CANAL — SECTION 5.

Constructing a new iron bridge with double driveways and sidewalks over the Erie canal at South Washington street, Rome:

(Chapter 522, Laws of 1910.)

Engineering		83 02

ERIE CANAL — SECTION 6.

Constructing a lift or hoist bridge over the Erie canal at Franklin street, Syracuse:

(Chapter 453, Laws of 1909, and Chapter 527, Laws of 1910.)

Engineering		2,683 13

ERIE CANAL — SECTION 9.

Constructing a lift bridge over the Erie canal at Allen street, Rochester:

(Chapter 291, Laws of 1908, and Chapter 356, Laws of 1910.)

Engineering	$707 57	
Inspection	536 25	
Wm. T. McKibben Company, contractors	6,998 98	
		8,242 80

ERIE CANAL — SECTION 10.

Arching over and otherwise improving the portion of Eighteen Mile creek from East avenue to Pound street in the city of Lockport:

(Chapter 466, Laws of 1908, and Chapter 433, Laws of 1909.)

(Work done by department forces of Superintendent of Public Works.)

Labor	$4,389 23	
Material, supplies and incidental expenses	4,599 72	
		8,988 95
Carried forward		$46,313 40

Brought forward		$46,313 40

ERIE CANAL — SECTION 11.

Constructing a bridge over the Erie canal at Georgia street, Buffalo:

(Chapter 452, Laws of 1909.)

Engineering	$1,087 49	
Advertising for bids	52 00	
Lupfer and Remick, contractors	8,901 00	
		10,040 49
Total Erie canal		$56,353 89

BLACK RIVER CANAL.

Improvement of the Black River canal and the repair and reconstruction of the structures thereof between the junction with the Erie canal in the city of Rome and the northerly boundary line of the village of Boonville:

(Chapter 196, Laws of 1909.)

(Work done by department forces of Superintendent of Public Works.)

Labor	$35,636 71	
Material, supplies and incidental expenses	17,298 25	
Total Black River canal		52,934 96

CHEMUNG CANAL.

Repair of Breakwater "D" in Seneca lake at Watkins:

(Chapter 264, Laws of 1908.)

(Work done by department forces of Superintendent of Public Works.)

Material, supplies and incidental expenses	586 45
Total Chemung canal	$586 45
Total extraordinary repairs, all canals	$109,875 30

CLASSIFICATION OF EXPENDITURES ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO BARGE CANALS FOR EACH FISCAL YEAR TO AND INCLUDING SEPTEMBER 30, 1910.

FOR THE PURPOSE OF	1904.	1905.	1906.	1907.	1908.	1909.	1910.	Total.
Engineering expenses	$168,577 98	$315,177 53	$443,863 52	$506,122 94	$742,790 19	$906,629 76	$904,475 82	$3,977,637 74
Salaries and expenses of Advisory Board of Consulting Engineers	21,061 38	37,593 58	36,855 00	34,156 10	41,403 13	41,299 76	41,664 86	254,033 81
Salary and expenses of Advisory Engineer to Superintendent of Public Works				1,111 11	9,999 96	10,833 37	916 66	22,861 10
Payments to contractors on estimates		46,890 00	496,954 58	1,369,041 29	3,214,882 61	6,804,841 18	7,549,005 67	19,481,615 33
Payments to contractors for damages						108,893 30	4,463 92	113,357 22
Constructing highways in lieu of existing highways						1,581 33	9,599 54	11,180 87
Protecting existing canal structures				1,146 42	14,837 09	14,991 34	8,740 27	39,715 12
Advertising for bids on contracts		735 50	951 35	1,459 70	2,977 55	3,984 30	4,018 35	14,126 75
Expenses in the printing and execution of contracts, serving notices of appropriations of lands, etc		998 91	1,229 78	1,901 52	1,729 50	2,263 58	3,372 23	11,495 52
Recording maps of lands appropriated		149 86	37 67	332 94	193 43	396 45	1,383 20	2,493 55
Recording deeds of lands appropriated			9 90	43 68	74 82	73 34	136 26	338 00
Payments for lands appropriated and for damages to lands, etc		1,622 24	174,594 88	188,002 24	179,499 20	343,365 88	777,289 25	1,664,373 69
Salaries and expenses of Board of Special Examiners and Appraisers of lands	10,491 69	26,491 19	25,849 12	23,831 28	13,955 64			100,618 92
Salaries and expenses of Special Examiner and Appraiser of lands					2,697 49	6,549 39	7,263 14	16,510 02
Investigating claims, witness fees, etc			495 60	1,055 15	3,566 85	20,116 77	40,938 91	66,173 28
Preparing barge canal bonds		4,140 54		4,886 58	4,426 89	6,132 99	6,489 43	26,076 43
Advertising sale of barge canal bonds		3,033 50	3,080 50	2,585 50	328 50	17,607 38	2,018 29	28,653 67
Publishing barge canal proposition	129,126 25							129,126 25
Clerical services to Comptroller			120 97	1,059 82	1,200 00	2,837 91	3,856 75	9,075 45
Total	$329,257 30	$436,832 85	$1,174,042 87	$2,136,736 27	$4,234,562 85	$8,292,398 03	$9,365,632 55	$25,969,462 72
Unexpended balances September 30, 1910, in hands of Division Engineers								12,493 82
								$25,981,956 54

Statement of Expenditures by Division Engineers for the Fiscal Year Ended September 30, 1910, on Account of the Construction of the Erie, Champlain and Oswego Canals Under Chapter 147, Laws of 1903, Distributed to the Various Sections of the Canals.

FOR WHAT PURPOSE.	Erie Canal.												Champlain Canal.				Oswego canal.	Total all canals.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.	Section 8.	Section 9.	Section 10.	Section 11.	Total.	Section 1.	Section 2.	Section 3.	Total.		
Division Engineers.																		
Preliminary Engineering.																		
Head office	$14,968 13	$20,482 69	$23,633 89	$19,694 89	$31,399 28	$9,622 39	$9,622 35	$21,045 42	$40,177 60	$29,654 89	$4,783 05	$225,084 58	$16,149 82	$8,665 74	$14,574 24	$39,389 80	$16,881 35	$281,355 73
Division office	1,627 58	2,227 20	2,569 84	2,141 55	5,467 75	1,675 61	1,675 59	4,093 27	7,814 43	5,767 78	930 29	35,990 89	2,460 71	1,320 36	2,220 63	6,001 70	3,406 68	45,399 27
Residency office	3,060 80	4,714 82	5,441 72	4,204 07	9,474 65	2,172 62	2,172 66	9,821 67	10,511 50	7,229 56	1,222 97	60,027 04	8,037 09	6,153 97	2,604 22	16,795 28	4,706 05	81,528 37
Field work surveys					1,370 18			5,388 08	9,851 62	4,656 58		21,266 46	861 92			861 92	1,875 66	24,004 04
Field work, borings and soundings					1,051 95			3,214 47		145 97		4,412 39						4,412 39
Field work, water supply	140 00	305 00	482 00	1,297 25	16,680 24	732 17	455 27	187 79	121 52		75 28	20,476 52	565 00	732 00	55 97	1,352 97	576 00	22,405 49
Total Preliminary Engineering	$19,796 51	$27,729 71	$32,127 45	$27,337 76	$65,444 05	$14,202 79	$13,925 87	$43,750 70	$68,476 67	$47,454 78	$7,011 59	$367,257 88	$28,074 54	$16,872 07	$19,455 06	$64,401 67	$27,445 74	$459,105 29
Construction Engineering.																		
Contract No. 1														$2,936 77		$2,936 77		$2,936 77
Contract No. 2	$1,239 05											$1,239 05						1,239 05
Contract No. 2E	7,578 32											7,578 32						7,578 32
Contract No. 3														2,936 74		2,936 74		2,936 74
Contract No. 4					$5,009 12							5,009 12						5,009 12
Contract No. 6									$5,288 22			5,288 22						5,288 22
Contract No. 7					127 74							127 74						127 74
Contract No. 8		$21,047 47										21,047 47						21,047 47
Contract No. 9										$7,812 60		7,812 60						7,812 60
Contract No. 10																	$11,590 24	11,590 24
Contract No. 11	13,189 18											13,189 18						13,189 18
Contract No. 12						$5,577 24	$5,577 26					11,154 50						11,154 50
Contract No. 13				$466 90		839 11						1,306 01						1,306 01
Contract No. 14	7,879 21	19,729 64	$23,863 99									51,472 84						51,472 84
Contract No. 15															$11,016 35	11,016 35		11,016 35
Contract No. 17			15,648 65									15,648 65						15,648 65
Contract No. 18				11,785 14								11,785 14						11,785 14
Contract No. 19											$8,210 19	8,210 19						8,210 19
Contract No. 20A				686 54								686 54						686 54
Contract No. 20B			4,482 00									4,482 00						4,482 00
Contract No. 20C			3,671 03									3,671 03						3,671 03
Contract No. 20D		3,208 88	705 91									3,914 79						3,914 79
Contract No. 21									2,511 46			2,511 46						2,511 46
Contract No. 23									10,406 85			10,406 85						10,406 85
Contract No. 25															13,457 82	13,457 82		13,457 82
Contract No. 26														1,518 64		1,518 64		1,518 64
Contract No. 27														5,036 90		5,036 90		5,036 90
Contract No. 29				7,860 31								7,860 31						7,860 31
Contract No. 30				14,297 67								14,297 67						14,297 67
Contract No. 31				12,573 31								12,573 31						12,573 31
Contract No. 32														2,751 11	680 43	3,431 54		3,431 54
Contract No. 33															175 56	175 56	579 88	755 44
Contract No. 35																	9,851 03	9,851 03
Contract No. 38									46 25			46 25						46 25
Contract No. 39																	2,233 17	2,233 17
Contract No. 40										7,707 00		7,707 00						7,707 00
Contract No. 41									4,422 82			4,422 82						4,422 82
Contract No. 42					8,829 49							8,829 49						8,829 49
Contract No. 43					3,038 91							3,038 91						3,038 91
Contract No. 44					4,779 19							4,779 19						4,779 19
Contract No. 45						7,186 65						7,186 65						7,186 65
Contract No. 46							8,113 78					8,113 78						8,113 78
Contract No. 47								$9,865 47				9,865 47						9,865 47
Contract No. 49								3,071 20				3,071 20						3,071 20
Contract No. 53																	8,256 70	8,256 70
Contract No. 54														2,220 86		2,220 86		2,220 86
Contract No. 55					13,825 52							13,825 52						13,825 52
Contract No. 60									12,633 98			12,633 98						12,633 98
Contract No. 61									9,909 91			9,909 91						9,909 91
Contract No. 62										753 34		753 34						753 34
Contract No. 63									3,106 71			3,106 71						3,106 71
Contract No. 64										6,198 03		6,198 03						6,198 03
Contract No. 66										9,043 78		9,043 78						9,043 78
Contract No. 68													$17,122 67			17,122 67		17,122 67
Contract No. 69													4,424 03			4,424 03		4,424 03
Contract No. 70													1,273 63			1,273 63		1,273 63
Contract No. 71													5,093 04			5,093 04		5,093 04
Contract No. 72													4,906 90			4,906 90		4,906 90
Contract No. 73													818 70			818 70		818 70
Contract No. 78																	2,322 06	2,322 06
Contract No. 90						106 09						106 09			178 19	178 19	78 00	362 28
Total Construction Engineering	$29,885 76	$43,985 99	$48,371 58	$47,669 87	$35,609 97	$13,709 09	$13,691 04	$12,936 67	$48,326 20	$31,514 75	$8,210 19	$333,911 11	$33,638 97	$17,401 02	$25,508 35	$76,548 34	$34,911 08	$445,370 53
Total Preliminary Engineering	$19,796 51	$27,729 71	$32,127 45	$27,337 76	$65,444 05	$14,202 79	$13,925 87	$43,750 70	$68,476 67	$47,454 78	$7,011 59	$367,257 88	$28,074 54	$16,872 07	$19,455 06	$64,401 67	$27,445 74	$459,105 29
Total Construction Engineering	29,885 76	43,985 99	48,371 58	47,669 87	35,609 97	13,709 09	13,691 04	12,936 67	48,326 20	31,514 75	8,210 19	333,911 11	33,638 97	17,401 02	25,508 35	76,548 34	34,911 08	445,370 53
Total Division Engineers	$49,682 27	$71,715 70	$80,499 03	$75,007 63	$101,054 02	$27,911 88	$27,616 91	$56,687 37	$116,802 87	$78,969 53	$15,221 78	$701,168 99	$61,713 51	$34,273 09	$44,963 41	$140,950 01	$62,356 82	$904,475 82

STATEMENT OF EXPENDITURES BY SUPERINTENDENT OF PUBLIC WORKS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, DISTRIBUTED TO THE VARIOUS SECTIONS OF THE CANALS.

FOR WHAT PURPOSE.	ERIE CANAL.												CHAMPLAIN CANAL.				Oswego canal.	Total all canals.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.	Section 8.	Section 9.	Section 10.	Section 11.	Total.	Section 1.	Section 2.	Section 3.	Total.		
SUPERINTENDENT OF PUBLIC WORKS.																		
Advertising for Bids.																		
Contract No. 2E	$577 27											$577 27						$577 27
Contract No. 21									$114 00			114 00						114 00
Contract No. 33	45 52											45 52			$45 52	$45 52	$45 52	136 50
Contract No. 36		$39 53	$39 54						39 54			118 61						118 61
Contract No. 39																	121 88	121 88
Contract No. 43					$210 48							210 48						210 48
Contract No. 44					136 56							136 56						136 56
Contract No. 49								$198 55				198 55						198 55
Contract No. 54														$118 61		118 61		118 61
Contract No. 62										$379 95		379 95						379 95
Contract No. 63									210 15			210 15						210 15
Contract No. 69													$118 61			118 61		118 61
Contract No. 70													136 56			136 56		136 56
Contract No. 71													136 57			136 57		136 57
Contract No. 72													118 62			118 62		118 62
Contract No. 73													355 65			355 65		355 65
Contract No. 75									99 27	99 28		198 55						198 55
Contract No. 78																	121 87	121 87
Contract No. 90						$131 10						131 10			131 10	131 10	131 10	393 30
Advertising for bids for sale of hay, Contract 14		35 00										35 00						35 00
Advertising appropriation o cemetaries, burial places or graves within sites of Contracts 14, 55, 71	11 25	11 25			31 50							54 00	27 00			27 00		81 00
Total	$634 04	$85 78	$39 54		$378 54	$131 10		$198 55	$462 96	$479 23		$2,409 74	$893 01	$118 61	$176 62	$1,188 24	$420 37	$4,018 35
Recording Appropriations of Lands.																		
Contract No. 6									$10 00			$10 00						$10 00
Contract No. 9										$53 75		53 75						53 75
Contract No. 10																	$2 00	2 00
Contract No. 12						$ 75						75						75
Contract No. 14	$60 78	$96 77	$ 60									158 15						158 15
Contract No. 18				$5 55								5 55						5 55
Contract No. 19											$85 25	85 25						85 25
Contract No. 20B			4 80									4 80						4 80
Contract No. 20C			7 20									7 20						7 20
Contract No. 21									56 00			56 00						56 00
Contract No. 23									62 00			62 00						62 00
Contract No. 26														$1 50		$1 50		1 50
Contract No. 27														75		75		75
Contract No. 29				28 50								28 50						28 50
Contract No. 30				77 75								77 75						77 75
Contract No. 31				13 00								13 00						13 00
Contract No. 38									10 00			10 00						10 00
Contract No. 40										14 75		14 75						14 75
Contract No. 41									22 00			22 00						22 00
Contract No. 42					$45 75							45 75						45 75
Contract No. 43					15 75							15 75						15 75
Contract No. 44					26 25							26 25						26 25
Contract No. 45						75						75						75
Contract No. 46							$22 50					22 50						22 50
Contract No. 47								$21 00				21 00						21 00
Contract No. 49								16 50				16 50						16 50
Contract No. 53																	1 00	1 00
Contract No. 55					90 00							90 00						90 00
Contract No. 60									178 50			178 50						178 50
Contract No. 61									264 00			264 00						264 00
Contract No. 63									4 00			4 00						4 00
Contract No. 64										44 00		44 00						44 00
Contract No. 66										18 50		18 50						18 50
Contract No. 68													$2 00			2 00		2 00
Contract No. 69													1 00			1 00		1 00
Contract No. 70													1 00			1 00		1 00
Contract No. 71													3 00			3 00		3 00
Contract No. 73													2 00			2 00		2 00
Contract No. 78																	12 00	12 00
Total	$60 78	$96 77	$12 60	$124 80	$177 75	$1 50	$22 50	$37 50	$606 50	$131 00	$85 25	$1,356 95	$9 00	$2 25		$11 25	$15 00	$1,383 20
Contractors.																		
Contract No. 1														$8,379 00		$8,379 00		$8,379 00
Contract No. 2E	$98,568 00											$98,568 00						98,568 00
Contract No. 3														14,398 00		14,398 00		14,398 00
Contract No. 4					$78,911 85							78,911 85						78,911 85
Contract No. 6									$114,651 00			114,651 00						114,651 00
Contract No. 7	1,475 19				6,289 82		$949 18		2,599 20			11,313 39		1,614 22		1,614 22		12,927 61
Contract No. 8		$186,102 47										186,102 47						186,102 47
Contract No. 9										$238,057 26		238,057 26						238,057 26
Contract No. 10																	$211,311 00	211,311 00
Contract No. 11	226,941 00											226,941 00						226,941 00
Contract No. 12						$183,213 00	162,081 00					345,294 00						345,294 00
Contract No. 13				$8,253 00		6,597 00						14,850 00						14,850 00
Contract No. 14	117,270 00	168,274 40	$298,219 58									583,763 98						583,763 98
Contract No. 15															$150,000 00	150,000 00		150,000 00
Contract No. 17			164,006 40									164,006 40						164,006 40
Contract No. 18				76,707 00								76,707 00						76,707 00
Contract No. 19											$226,826 44	226,826 44						226,826 44
Contract No. 20A				30,699 00								30,699 00						30,699 00
Contract No. 20B			4,455 00									4,455 00						4,455 00
Contract No. 20C			3,006 00									3,006 00						3,006 00
Contract No. 21									82,368 00			82,368 00						82,368 00
Contract No. 23									162,963 00			162,963 00						162,963 00
Contract No. 25															247,032 00	247,932 00		247,932 00
Contract No. 26														14,823 00		14,823 00		14,823 00
Contract No. 29				96,588 00								96,588 00						96,588 00
Contract No. 30				115,767 00								115,767 00						115,767 00
Contract No. 31				168,706 27								168,706 27						168,706 27
Contract No. 32														24,921 00	13,356 00	38,277 00		38,277 00
Contract No. 35																	79,209 00	79,209 00
Contract No. 38									2,783 95			2,783 95						2,783 95
Contract No. 39																	4,320 00	4,320 00
Contract No. 40										583,799 16		583,799 16						583,799 16
Contract No. 41									120,697 47			120,697 47						120,697 47
Contract No. 42					176,094 00							176,094 00						176,094 00
Contract No. 44					75,681 00							75,681 00						75,681 00
Contract No. 45						98,129 88						98,129 88						98,129 88
Contract No. 46							238,725 00					238,725 00						238,725 00
Contract No. 47								$400,716 00				400,716 00						400,716 00
Contract No. 49								19,449 00				19,449 00						19,449 00
Contract No. 53																	118,818 00	118,818 00
Contract No. 54														8,433 00		8,433 00		8,433 00
Contract No. 55					380,871 00							380,871 00						380,871 00
Contract No. 60									385,080 23			385,080 23						385,080 23
Contract No. 61									170,660 70			170,660 70						170,660 70
Contract No. 63									693 00			693 00						693 00
Contract No. 64										214,173 00		214,173 00						214,173 00
Contract No. 66										164,142 00		164,142 00						164,142 00
Contract No. 68													$301,473 00			301,473 00		301,473 00
Contract No. 69													51,507 00			51,507 00		51,507 00
Contract No. 70													81,711 00			81,711 00		81,711 00
Contract No. 71													60,795 00			60,795 00		60,795 00
Contract No. 72													78,480 00			78,480 00		78,480 00
Contract No. 73													1,491 00			1,494 00		1,491 00
Contract No. 78																	13,131 00	13,131 00
Total	$444,254 19	$354,376 87	$469,686 98	$496,720 27	$717,847 67	$287,939 88	$401,755 18	$420,165 00	$1,042,496 55	$1,200,171 42	$226,826 44	$6,062,240 45	$575,460 00	$72,568 22	$411,048 00	$1,059,976 22	$426,789 00	$7,549,005 67
Miscellaneous Expenses.																		
Serving notices of appropriation of lands, printing and executing contracts, etc	$173 53	$237 47	$273 99	$228 32	$364 02	$111 55	$111 55	$243 98	$465 79	$343 80	$55 45	$2,609 45	$187 23	$100 47	$168 97	$456 67	$105 71	$3,261 83
Salary and expenses of Advisory Engineer	48 77	66 73	77 00	64 17	102 30	31 35	31 35	68 57	130 90	96 61	15 58	733 33	52 62	28 23	47 48	128 33	55 00	916 66
Watchmen on Contract 18, Mindenville				1,951 65								1,951 65						1,951 65
Repairs to temporary bridge at Fort Edward, Contract 27														659 69		659 69		659 69
Repairs to Dunham's Basin bridge, Contract 27														4,610 41		4,610 41		4,610 41
Repairs to Howlands Island bridge, Contract 5							47 15					47 15						47 15
Construction of Road "B," Contract 40										5,315 14		5,315 14						5,315 14
Construction of Road "D," Contract 19											874 67	874 67						874 67
Construction of Road "F," Contract 19											1,044 25	1,044 25						1,044 25
Completing highway, Contract 60									2,365 48			2,365 48						2,365 48
Repairs to temporary bridge No. 75 at Fort Miller, Contract 3														232 00		232 00		232 00
Patrolmen Contracts 9, 19, 40, 60, 61, 64, 66									128 40	1,056 78	54 19	1,239 37						1,239 37
Stenographic services					110 40							110 40						110 40
Total	$222 30	$304 20	$350 99	$2,244 14	$576 72	$142 90	$190 05	$312 55	$3,090 57	$6,812 33	$2,044 14	$16,290 89	$239 85	$5,630 80	$216 45	$6,087 10	$250 71	$22,628 70
Total advertising for bids	$634 04	$85 78	$39 54		$378 54	$131 10		$198 55	$462 96	$479 23		$2,409 74	$893 01	$118 61	$176 62	$1,188 24	$420 37	$4,018 35
Total recording appropriation of lands	60 78	96 77	12 60	$124 80	177 75	1 50	$22 50	37 50	606 50	131 00	$85 25	1,356 95	9 00	2 25		11 25	15 00	1,383 20
Total contractors	444,254 19	354,376 87	469,686 98	496,720 27	717,847 67	287,939 88	401,755 18	420,165 00	1,042,496 55	1,200,171 42	226,826 44	6,062,240 45	575,460 00	72,568 22	411,048 00	1,059,976 22	426,789 00	7,549,005 67
Total miscellaneous expenses	222 30	304 20	350 99	2,244 14	576 72	142 90	190 05	312 55	3,090 57	6,812 33	2,044 14	16,290 89	239 85	5,630 80	216 45	6,087 10	250 71	22,628 70
Total Superintendent of Public Works	$445,171 31	$354,863 62	$470,090 11	$499,089 21	$718,980 68	$288,215 38	$401,967 73	$420,713 60	$1,046,656 58	$1,207,593 98	$228,955 83	$6,082,298 03	$576,601 86	$78,319 88	$412,341 07	$1,067,262 81	$427,475 08	$7,577,035 92

STATEMENT OF EXPENDITURES FOR DAMAGES FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, UNDER CHAPTER 147, LAWS OF 1903, DISTRIBUTED TO THE VARIOUS SECTIONS OF THE CANALS.

FOR WHAT PURPOSE.	ERIE CANAL.												CHAMPLAIN CANAL.				Oswego Canal.	Total all canals.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.	Section 8.	Section 9.	Section 10.	Section 11.	Total.	Section 1.	Section 2.	Section 3.	Total.		
Payments for lands appropriated:																		
On Contract No. 1														$1,043 65		$1,043 65		$1,043 65
On Contract No. 3														7,967 83		7,967 83		7,967 83
On Contract No. 4					$7,118 47							$7,118 47						7,118 47
On Contract No. 5							$3,713 21					3,713 21						3,713 21
On Contract No. 6									$16,220 85			16,220 85						16,220 85
On Contract No. 8		$6,923 33										6,923 33						6,923 33
On Contract No. 9										$4,669 68		4,669 68						4,669 68
On Contract No. 10																	$9,498 10	9,498 10
On Contract No. 12						$16,458 47	1,368 46					17,826 93						17,826 93
On Contract No. 14	$2,832 77	273,239 02	$9,413 25									285,485 04						285,485 04
On Contract No. 15															$53,317 68	53,317 68		53,317 68
On Contract No. 17			594 03									594 03						594 03
On Contract No. 18				$13,084 32								13,084 32						13,084 32
On Contract No. 19											$11,518 13	11,518 13						11,518 13
On Contract No. 25															51,165 91	51,165 91		51,165 91
On Contract No. 27														35,500 65		35,500 65		35,500 65
On Contract No. 30				938 47								938 47						938 47
On Contract No. 35																	6,591 55	6,591 55
On Contract No. 40										32,949 56		32,949 56						32,949 56
On Contract No. 41									5,241 64			5,241 64						5,241 64
On Contract No. 45						17,177 73						17,177 73						17,177 73
On Contract No. 47								$13,830 58				13,830 58						13,830 58
On Contract No. 55					92,239 27							92,239 27						92,239 27
On Contract No. 60									16,455 36			16,455 36						16,455 36
On Contract No. 61									9,680 96			9,680 96						9,680 96
On Contract No. 64										8,961 14		8,961 14						8,961 14
On Contract No. 66										35,609 95		35,609 95						35,609 95
On Contract No. 68													$7,987 72			7,987 72		7,987 72
Total	$2,832 77	$280,162 35	$10,007 28	$14,022 79	$99,357 74	$33,636 20	$5,081 67	$13,830 58	$47,598 81	$82,190 33	$11,518 13	$600,238 65	$7,987 72	$44,512 13	$104.483 59	$156,983 44	$16,089 65	$773,311 74
Payments for lands damaged:																		
On Contract No. 1														$852 84		$852 84		$852 84
On Contract No. 15															$2,006 67	2,006 67		2,006 67
On Contract No. 44					$25 00							$25 00						25 00
On Contract No. 55					30 00							30 00						30 00
Total					$55 00							$55 00		$852 84	$2,006 67	$2,859 51		$2,914 51
Damages to Contractors:																		
On Contract No. 17			$3,731 79									$3,731 79						$3,731 79
On Contract No. 18				$732 13								732 13						732 13
Total			$3,731 79	$732 13								$4,463 92						$4,463 92
Total payments for lands appropriated	$2,832 77	$280,162 35	$10,007 28	$14,022 79	$99,357 74	$33,636 20	$5,081 67	$13,830 58	$47,598 81	$82,190 33	$11,518 13	$600,238 65	$7,987 72	$44,512 13	$104,483 59	$156,983 44	$16,089 65	$773,311 74
Total payments for lands damaged					55 00							55 00		852 84	2,006 67	2,859 51		2,914 51
Total payments for damages to contractors			3,731 79	732 13								4,463 92						4,463 92
Total damages	$2,832 77	$280,162 35	$13,739 07	$14,754 92	$99,412 74	$33,636 20	$5,081 67	$13,830 58	$47,598 81	$82,190 33	$11,518 13	$604,757 57	$7,987 72	$45,364 97	$106,490 26	$159,842 95	$16,089 65	$780,690 17
Investigating claims, witness fees, etc	$559 90	$376 23	$30 00	$1,486 86	$2,353 37	$953 07	$96 80	$520 63	$1,451 89	$2,209 02	$2,627 00	$12,664 77	$109 50	$1,047 41	$770 93	$1,927 84	$26,346 30	$40,938 91

Statement of Miscellaneous Expenditures for the Fiscal Year Ended September 30, 1910, on Account of the Construction of the Erie, Champlain and Oswego Canals, Under Chapter 147, Laws of 1903, Distributed to the Various Sections of the Canals.

FOR WHAT PURPOSE.	ERIE CANAL.												CHAMPLAIN CANAL.				Oswego canal.	Total all canals.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.	Section 8.	Section 9.	Section 10.	Section 11.	Total.	Section 1.	Section 2.	Section 3.	Total.		
MISCELLANEOUS.																		
Advisory Board of Consulting Engineers.																		
Salaries and expenses	$2,216 57	$3,033 20	$3,499 85	$2,916 54	$4,649 80	$1,424 94	$1,424 94	$3,116 53	$5,949 74	$4,391 48	$708 31	$33,331 90	$2,391 56	$1,283 27	$2,158 24	$5,833 07	$2,499 89	$41,664 86
Special Examiner and Appraiser:																		
Salaries and expenses	$386 40	$528 75	$610 10	$508 42	$810 58	$248 40	$248 40	$543 28	$1,037 18	$765 53	$123 47	$5,810 51	$416 90	$223 70	$376 23	$1,016 83	$435 80	$7,263 14
Comptroller:																		
Preparing Barge Canal Bonds	$345 24	$472 43	$545 12	$454 25	$724 22	$221 94	$221 94	$485 41	$926 69	$683 99	$110 31	$5,191 54	$372 49	$199 88	$336 15	$908 52	$389 37	$6,489 43
Advertising sale of barge canal bonds	107 37	146 93	169 54	141 28	225 24	69 03	69 02	150 97	288 21	212 73	34 31	1,614 63	115 85	62 16	104 55	282 56	121 10	2,018 29
Recording deeds of lands taken	5 45	3 50	9 00	9 75	26 43	11 65	1 50	5 55	....	19 60	4 10	96 53	1 00	15 40	14 88	31 28	8 45	136 26
Clerical services	196 84	269 36	310 80	259 00	412 92	126 54	126 54	276 76	528 36	389 98	62 90	2,960 00	212 38	113 96	191 66	518 00	222 00	3,700 00
Miscellaneous payments	4 85	6 63	7 66	6 38	10 17	3 12	3 12	6 82	13 01	9 61	1 55	72 92	5 23	2 81	4 72	12 76	71 07	156 75
Total Comptroller	$659 75	$898 85	$1,042 12	$870 66	$1,398 98	$432 28	$422 12	$925 51	$1,756 27	$1,315 91	$213 17	$9,935 62	$706 95	$394 21	$651 96	$1,753 12	$811 99	$12,500 73
Total Advisory Board of Consulting Engineers	$2,216 57	$3,033 20	$3,499 85	$2,916 54	$4,649 80	$1,424 94	$1,424 94	$3,116 53	$5,949 74	$4,391 48	$708 31	$33,331 90	$2,391 56	$1,283 27	$2,158 24	$5,833 07	$2,499 89	$41,664 86
Total Special Examiner and Appraiser	386 40	528 75	610 10	508 42	810 58	248 40	248 40	543 28	1,037 18	765 53	123 47	5,810 51	416 90	223 70	376 23	1,016 83	435 80	7,263 14
Total Comptroller	659 75	898 85	1,042 12	870 66	1,398 98	432 28	422 12	925 51	1,756 27	1,315 91	213 17	9,935 62	706 95	391 21	651 96	1,753 12	811 99	12,500 73
Total Miscellaneous	$3,262 72	$4,460 80	$5,152 07	$4,295 62	$6,859 36	$2,105 62	$2,095 46	$4,585 32	$8,743 19	$6,472 92	$1,044 95	$49,078 03	$3,515 41	$1,901 18	$3,186 43	$8,603 02	$3,747 68	$61,428 73

Summary of Expenditures for the Fiscal Year Ended September 30, 1910, on Account of the Construction of the Erie, Champlain and Oswego Canals, Under Chapter 147, Laws of 1903, Distributed to the Various Sections of the Canals.

FOR WHAT PURPOSE.	ERIE CANAL.												CHAMPLAIN CANAL.				Oswego canal.	Total all canals.
	Section 1.	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.	Section 8.	Section 9.	Section 10.	Section 11.	Total.	Section 1.	Section 2.	Section 3.	Total.		
Division Engineers.																		
Preliminary engineering	$19,796 51	$27,729 71	$32,127 45	$27,337 76	$65,444 05	$14,202 79	$13,925 87	$43,750 70	$68,476 67	$47,454 78	$7,011 59	$367,257 88	$28,074 54	$16,872 07	$19,455 06	$64,401 67	$27,445 74	$459,105 29
Construction engineering	29,885 76	43,985 99	48,371 58	47,669 87	35,609 97	13,709 09	13,691 04	12,936 67	48,326 20	31,514 75	8,210 19	333,911 11	33,638 97	17,401 02	25,508 35	76,548 34	34,911 08	445,370 53
Superintendent of Public Works.																		
Advertising	634 04	85 78	39 54	....	378 54	131 10	....	198 55	462 96	479 23	....	2,409 74	893 01	118 61	176 62	1,188 24	420 37	4,018 35
Recording appropriations of lands	60 78	96 77	12 60	124 80	177 75	1 50	22 50	37 50	606 50	131 00	85 25	1,356 95	9 00	2 25	....	11 25	15 00	1,383 20
Contractors	444,254 19	354,376 87	469,686 98	496,720 27	717,847 67	287,939 88	401,755 18	420,165 00	1,042,496 55	1,200,171 42	226,826 44	6,062,240 45	575,460 00	72,568 22	411,948 00	1,059,976 22	426,789 00	7,549,005 67
Miscellaneous expenses	222 30	304 20	350 99	2,244 14	576 72	142 90	190 05	312 55	3,090 57	6,812 33	2,044 14	16,290 89	239 85	5,630 80	216 45	6,087 10	250 71	22,628 70
Damages.																		
Payments for lands appropriated	2,832 77	280,162 35	10,007 28	14,022 79	99,357 74	33,636 20	5,081 67	13,830 58	47,598 81	82,190 33	11,581 13	600,301 65	7,987 72	45,512 13	104,483 59	157,983 44	16,089 65	774,374 74
Payments for lands damaged	....	....	....	....	55 00	....	....	....	....	....	....	55 00	....	852 84	2,006 67	2,859 51	....	2,914 51
Payments for damages to contractors	....	....	3,731 79	732 13	....	....	....	....	....	....	....	4,463 92	....	....	....	....	....	4,463 92
Investigating claims, witness fees, etc	559 90	376 23	30 00	1,486 86	2,353 37	953 07	96 80	520 63	1,451 89	2,209 02	2,627 00	12,664 77	109 50	1,047 41	770 93	1,927 84	26,346 30	40,938 91
Miscellaneous Expenses.																		
Advisory Board of Consulting Engineers	2,216 57	3,033 20	3,499 85	2,916 54	4,649 80	1,424 94	1,424 94	3,116 53	5,949 74	4,391 48	708 31	33,331 90	2,391 56	1,283 27	2,158 24	5,833 07	2,499 89	41,664 86
Special examiner and appraiser	386 40	528 75	610 10	508 42	810 58	248 40	248 40	543 28	1,037 18	765 53	123 47	5,810 51	416 90	223 70	376 23	1,016 83	435 80	7,263 14
Comptroller	659 75	898 85	1,042 12	870 66	1,398 98	432 28	422 12	925 51	1,756 27	1,315 91	213 17	9,935 62	706 95	394 21	651 96	1,753 12	811 99	12,500 73
Total	$501,508 97	$711,578 70	$569,510 28	$594,634 24	$928,660 17	$352,822 15	$436,858 57	$496,337 50	$1,221,253 34	$1,377,435 78	$259,430 69	$7,450,030 39	$649,928 00	$161,906 53	$567,752 10	$1,379,586 63	$536,015 53	$9,365,632 55

THESE EXPENDITURES ARE DISTRIBUTED TO THE VARIOUS SECTIONS OF THE CANALS, AS FOLLOWS:

	1904.	1905.	1906.	1907.	1908.	1909.	1910.	Total.
Erie canal:								
Section 1	$31,011 96	$35,868 42	$190,862 47	$299,153 18	$718,647 34	$791,399 34	$501,508 97	$2,568,451 68
Section 2	17,254 96	29,421 73	38,232 03	129,107 10	288,247 60	774,917 69	711,578 70	1,988,759 81
Section 3	19,949 12	25,568 63	48,544 36	80,675 22	152,105 41	719,964 90	569,510 28	1,616,317 92
Section 4	16,596 26	19,567 48	38,107 81	87,516 48	276,318 54	443,613 10	594,634 24	1,476,353 91
Section 5	43,351 69	52,836 33	109,501 66	315,950 75	325,683 51	499,915 92	928,660 17	2,275,900 03
Section 6	10,891 74	25,315 38	18,421 83	14,733 10	102,877 44	841,276 93	352,822 15	1,366,338 57
Section 7	12,731 54	12,691 30	29,744 28	113,084 11	155,586 80	367,775 90	436,858 57	1,128,472 50
Section 8	18,101 39	19,740 28	23,166 65	36,859 41	60,042 07	121,218 53	496,337 50	775,465 83
Section 9	43,841 51	50,033 56	343,018 64	273,657 39	329,042 82	920,724 86	1,221,253 34	3,181,572 12
Section 10	37,866 10	34,068 19	51,212 59	47,925 83	104,836 09	765,847 85	1,377,435 78	2,419,192 43
Section 11	8,714 75	12,162 59	6,943 15	19,555 79	118,547 81	168,917 84	259,430 69	594,272 62
Total Erie canal	$260,311 02	$317,273 89	$897,755 47	$1,418,218 36	$2,631,935 43	$6,415,572 86	$7,450,030 39	$19,391,097 42
Champlain canal:								
Section 1	$13,735 26	$15,981 52	$18,597 50	$34,683 79	$35,580 75	$300,490 90	$649,928 00	$1,068,997 72
Section 2	20,229 63	47,170 80	205,731 15	484,261 06	541,104 22	370,722 91	161,906 53	1,831,126 30
Section 3	13,710 30	25,553 77	21,448 58	109,077 71	809,199 42	852,870 20	567,752 10	2,399,612 08
Total Champlain canal	$47,675 19	$88,706 09	$245,777 23	$628,022 56	$1,385,884 39	$1,524,084 01	$1,379,586 63	$5,299,736 10
Oswego canal	$21,271 09	$30,852 87	$30,510 17	$90,495 35	$216,743 03	$352,741 16	$536,015 53	$1,278,629 20
Total all canals	$329,257 30	$436,832 85	$1,174,042 87	$2,136,736 27	$4,234,562 85	$8,292,398 03	$9,365,632 55	$25,969,462 72
Unexpended balances September 30, 1910, in hands of Division Engineers	....	....	....	....	....	....	....	12,493 82
								$25,981,956 54

STATEMENT OF PAYMENTS MADE TO CONTRACTORS ON ACCOUNT OF THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, UNDER CHAPTER 147, LAWS 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910:

ERIE CANAL — SECTION 1.

Contract 2E, Holler and Shepard, Contractors.			
Estimates		$98,568 00	
Contract 7, Groton Bridge Co., Contractors.			
Estimates	$1,447 94		
Extra and unspecified work	27 25		
		1,475 19	
Contract 11, Fort Orange Construction Co., Contractors.			
Estimates	$225,441 00		
Extra and unspecified work	1,500 00		
		226,941 00	
Contract 14, Acme Engineering and Contracting Co., Contractors.			
Estimates		117,270 00	
Total section 1, Erie canal			$444,254 19

ERIE CANAL — SECTION 2.

Contract 8, Pittsburg-Eastern Co., Contractors.		
Estimates	$185,886 00	
Carried forward	$185,886 00	$444,254 19

Brought forward..	$185,886 00		$444,254 19
Extra and unspecified work..........	216 47		
		$186,102 47	
Contract 14, *Acme Engineering and Contracting Co., Contractors.*			
Estimates.........	$164,727 00		
Extra and unspecified work..........	3,547 40		
		168,274 40	
Total section 2, Erie canal.............			354,376 87

ERIE CANAL — SECTION 3.

Contract 14, *Acme Engineering and Contracting Co., Contractors.*			
Estimates........	$291,348 00		
Extra and unspecified work..........	6,871 58		
		$298,219 58	
Contract 17, *Alexander Murdock, Contractor.*			
Estimates........	$163,386 00		
Extra and unspecified work.........	620 40		
		164,006 40	
Contract 20*B, S. Pearson and Son, Inc., Contractors.*			
Estimates.................		4,455 00	
Carried forward...........		$466,680 98	$798,631 06

Brought forward		$466,680 98	$798,631 06
Contract 20C, American Pipe and Construction Co., Contractors.			
Estimates		3,006 00	
Total section 3, Erie canal			469,686 98

ERIE CANAL — SECTION 4.

Contract 13, Penn Bridge Co., Contractors.			
Estimates		$8,253 00	
Contract 18, Kelly Bros.' Contracting Co., Contractors.			
Estimates	$70,002 00		
Extra and unspecified work	6,705 00		
		76,707 00	
Contract 20A, Houston Barnard, Contractor.			
Estimates		30,699 00	
Contract 29, Maryland Dredging and Contracting Co., Contractors.			
Estimates		96,588 00	
Contract 30, Acme Engineering and Contracting Co., Contractors.			
Estimates		115,767 00	
Contract 31, Casey and Murray, Contractors.			
Estimates	$168,255 00		
Carried forward	$168,255 00	$328,014 00	$1,268,318 04

Brought forward..	$168,255 00	$328,014 00	$1,268,318 04
Extra and unspecified work...........	451 27		
		168,706 27	
Total section 4, Erie canal..............			496,720 27

ERIE CANAL — SECTION 5.

Contract 4, Empire Engineering Corporation, Contractors.			
Estimates	$70,533 00		
Extra and unspecified work..........	8,378 85		
		$78,911 85	
Contract 7, Groton Bridge Co., Contractors.			
Estimates	$3,146 65		
Extra and unspecified work...........	3,143 17		
		6,289 82	
Contract 42, Shanley-Morrissey, Inc., Contractors.			
Estimates..................		176,094 00	
Contract 44, Scott Bros., Contractors.			
Estimates..................		75,681 00	
Contract 55, Arthur McMullen, Contractor.			
Estimates..................		380,871 00	
Total section 5, Erie canal.............			717,847 67
Carried forward			$2,482,885 98

Brought forward			$2,482,885 98
ERIE CANAL — SECTION 6.			
Contract 12, Stewart-Kerbaugh-Shanley Co., assigned to James Stewart and Company, Contractors.			
Estimates		$183,213 00	
Contract 13, Penn Bridge Co., Contractors.			
Estimates		6,597 00	
Contract 45, Scott Bros., Contractors.			
Estimates	$97,263 00		
Extra and unspecified work	866 88		
		98,129 88	
Total section 6, Erie canal			287,939 88
ERIE CANAL — SECTION 7.			
Contract 7, Groton Bridge Co., Contractors.			
Estimates		$949 18	
Contract 12, Stewart-Kerbaugh-Shanley Co., assigned to James Stewart and Company, Contractors.			
Estimates		162,081 00	
Contract 46, Kinser Construction Co., Contractors.			
Estimates		238,725 00	
Total section 7, Erie canal			401,755 18
Carried forward			$3,172,581 04

Brought forward			$3,172,581 04
ERIE CANAL — SECTION 8.			
Contract 47, The Crowell and Sherman Co., assigned to Crowell-Sherman-Stalter Co., Contractors.			
Estimates		$400,716 00	
Contract 49, Bellew and Merritt Co., Contractors.			
Estimates		19,449 00	
Total section 8, Erie canal			420,165 00
ERIE CANAL — SECTION 9.			
Contract 6, Marie H. Maselli, Executrix of Estate of Frank A. Maselli, Deceased, Contractor.			
Estimates		$114,651 00	
Contract 7, Groton Bridge Co., Contractors.			
Estimates		2,599 20	
Contract 21, Lane Bros.' Co., Contractors.			
Estimates		82,368 00	
Contract 23, Millard and Lupton Co., Contractors.			
Estimates		162,963 00	
Contract 38, Henry Tosh and Son, Contractors.			
Estimates	$2,435 67		
Carried forward	$2,435 67	$362,581 20	$3,592,746 04

Brought forward..	$2,435 67	$362,581 20	$3,592,746 04
Extra and unspecified work	348 28		
		2,783 95	
Contract 41, Butler Bros.' Construction Co., Contractors.			
Estimates	$120,600 00		
Extra and unspecified work	97 47		
		120,697 47	
Contract 60, Empire Engineering Corporation, Contractors.			
Estimates	$379,125 00		
Extra and unspecified work	5,955 23		
		385,080 23	
Contract 61, Cleveland and Sons Co., Contractors.			
Estimates	$170,559 00		
Extra and unspecified work	101 70		
		170,660 70	
Contract 63 H. S. Kerbaugh, Inc., Contractors.			
Estimates		693 00	
Total section 9, Erie canal.............			1,042,496 55

ERIE CANAL — SECTION 10.

Contract 9, Thomas Crimmins Contracting Co., Contractors.			
Estimates	$234,567 00		
Carried forward..	$234,567 00		$4,635,242 59

Brought forward	$234,567 00		$4,635,242 59
Extra and unspecified work	3,490 26		
		238,057 26	
Contract 40, United Engineering and Contracting Co., Contractors.			
Estimate	$583,704 00		
Extra and unspecified work	95 16		
		583,799 16	
Contract 64, Empire Engineering Corporation, Contractors.			
Estimates	$214,065 00		
Extra and unspecified work	108 00		
		214,173 00	
Contract 66, Empire Engineering Corporation, Contractors.			
Estimates		164,142 00	
Total section 10, Erie canal			1,200,171 42
SECTION 11 — ERIE CANAL.			
Contract 19, Great Lakes Construction Co., Contractors.			
Estimates	$225,981 00		
Extra and unspecified work	845 44		
		$226,826 44	
Total section 11, Erie canal			226,826 44
Total Erie canal			$6,062,240 45

Section 1, Champlain Canal.

Contract 68, *Shanley-Morrissey, Inc., Contractors.*			
Estimates		$301,473 00	
Contract 69, *I. A. Hodge and Co., Contractors.*			
Estimates		51,507 00	
Contract 70, *Shanley-Morrissey, Inc., Contractors.*			
Estimates		81,711 00	
Contract 71, *Shanley-Morrissey, Inc., Contractors.*			
Estimates		60,795 00	
Contract 72, *Shanley-Morrissey, Inc., Contractors.*			
Estimates		78,480 00	
Contract 73, *E. M. Graves, Contractor.*			
Estimates		1,494 00	
Total section 1, Champlain canal			$575,460 00

Section 2 — Champlain Canal.

Contract 1, *Empire Engineering Corporation, Contractors.*			
Estimate		$8,379 00	
Contract 3, *Sundstrom and Stratton, Contractors.*			
Estimates	$14,382 00		
Extra and unspecified work	16 00		
		14,398 00	
Carried forward		$22,777 00	$575,460 00

Brought forward	$22,777 00	$575,460 00
Contract 7, Groton Bridge Co., Contractors.		
Estimates	1,614 22	
Contract 26, Lake Erie Dredging Co., Contractors.		
Estimates	14,823 00	
Contract 32, Penn Bridge Co., Contractors.		
Estimates	24,921 00	
Contract 54, Scott Bros., Contractors.		
Estimates	8,433 00	
Total section 2, Champlain canal		72,568 22
SECTION 3 — CHAMPLAIN CANAL.		
Contract 15, Atlantic, Gulf and Pacific Co., Contractors.		
Estimates	$150,660 00	
Contract 25, Atlantic, Gulf and Pacific Co., Contractors.		
Estimates	247,932 00	
Contract 32, Penn Bridge Co., Contractors.		
Estimates	13,356 00	
Total section 3, Champlain canal		411,948 00
Total Champlain canal		$1,059,976 22
OSWEGO CANAL.		
Contract 10, McDermott Contracting Co., Contractors.		
Estimates	$211,311 00	
Carried forward	$211,311 00	

Brought forward	$211,311 00	
Contract 35, Gilmour-Horton-Allen Co., Contractors.		
Estimates	79,209 00	
Contract 39, James Stewart and Co., Contractors.		
Estimates	4,320 00	
Contract 53, Scott Bros., Contractors.		
Estimates	118,818 00	
Contract 78, Cunningham-Woodard Co., Contractors.		
Estimates	13,131 00	
Total Oswego canal		$426,789 00

SUMMARY.

	Estimates.	Extra and unspecified work.	Total.
Erie canal	$6,018,870 64	$43,369 81	$6,062,240 45
Champlain canal	1,059,960 22	16 00	1,059,976 22
Oswego canal	426,789 00	....	426,789 00
	$7,505,619 86	$43,385 81	$7,549,005 67

STATEMENT OF SALARIES AND EXPENSES OF THE ADVISORY BOARD OF CONSULTING ENGINEERS FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, PAYABLE FROM FUND FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, PER CHAPTER 147, LAWS OF 1903.

Edward A. Bond, Chairman:		
Salary	$8,000 00	
Expenses	654 92	
		$8,654 92
Carried forward		$8,654 92

Brought forward		$8,654 92
Mortimer G. Barnes, member:		
Salary	$7,500 00	
Expenses	321 10	
		7,821 10
Thomas W. Symons, member:		
Salary	$7,500 00	
Expenses	404 97	
		7,904 97
William A. Brackenridge, member:		
Salary	$625 00	
Expenses	13 14	
		638 14
Joseph Ripley, member:		
Salary	$6,812 50	
Expenses	378 52	
		7,191 02
Alfred Brooks Fry, member:		
Salary	$7,500 00	
Expenses	181 81	
		7,681 81
Printing		1,114 16
Postage		220 00
Newspaper clippings		130 00
Stationery		110 19
Furniture, fixtures, office supplies, etc		97 55
Livery and automobile hire		51 00
Legislative index		50 00
		$41,664 86

Distributed to the various sections of the canal as follows:

Erie canal:

Section 1	$2,216 57
Section 2	3,033 20
Section 3	3,499 85
Section 4	2,916 54
Section 5	4,649 80
Carried forward	$16,315 96

Brought forward	$16,315 96	
Section 6	1,424 94	
Section 7	1,424 94	
Section 8	3,116 53	
Section 9	5,949 74	
Section 10	4,391 48	
Section 11	708 31	
Total Erie canal		$33,331 90
Champlain canal:		
Section 1	$2,391 56	
Section 2	1,283 27	
Section 3	2,158 24	
Total Champlain canal		$5,833 07
Oswego canal		2,499 89
Total all canals		$41,664 86

STATEMENT OF SALARIES AND EXPENSES OF THE SPECIAL EXAMINER AND APPRAISER FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, PAYABLE FROM FUND FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, PER CHAPTER 147, LAWS OF 1903:

Harvey J. Donaldson, appraiser:		
Salary	$4,368 30	
Expenses	956 24	
		$5,324 54
Emmor J. Caldwell, assistant appraiser:		
Salary	$132 05	
Expenses	54 00	
		186 05
Henriette Herkenham, stenographer, salary		900 00
Office rent		300 00
Telephone service		144 88
Office expenses		132 34
Carpet		113 75
Carried forward		$7,101 56

Brought forward	$7,101 56
Filing cases, etc	85 83
Printing	48 79
Stationery	20 96
Drinking water	6 00
Total	$7,263 14

Distributed to the various sections of the canal as follows:

Erie canal:		
Section 1	$386 40	
Section 2	528 75	
Section 3	610 10	
Section 4	508 42	
Section 5	810 58	
Section 6	248 40	
Section 7	248 40	
Section 8	543 28	
Section 9	1,037 18	
Section 10	765 53	
Section 11	123 47	
Total Erie canal		$5,810 51
Champlain canal:		
Section 1	$416 90	
Section 2	223 70	
Section 3	376 23	
Total Champlain canal		1,016 83
Oswego canal		435 80
Total, all canals		$7,263 14

STATEMENT SHOWING EXPENDITURES UNDER AGREEMENT WITH SPECIAL EXAMINER AND APPRAISER FOR LANDS APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
		SEC. 1. ERIE.			
740	Sarah Van Sly	Contract 14	$1,600 00	$215 67	$1,815 67
1974	N. and P. Steenburgh	Contract 14	1,000 00	17 10	1,017 10
			$2,600 00	$232 77	$2,832 77
		SEC. 2. ERIE.			
282	L. A. and E. J. Johnson	Contract 8	$5,112 15	$1,194 13	$6,306 28
732	N. Y. C. and H. R. R. R. Company	Contract 14	260,000 00	....	260,000 00
738	Irving L. and Mabel A. Taylor	Contract 14	550 00	55 87	605 87
739	Irving L. Taylor, et al	Contract 14	6,800 00	695 28	7,495 28
840	Methodist Episcopal Church, Crescent, N. Y	Contract 14	25 00	2 54	27 54
842	Henry W. Edwards, executor	Contract 14	20 00	1 56	21 56
2064	C. and E. Emerick	Contract 14	5,000 00	88 77	5,088 77
			$277,507 15	$2,038 15	$279,545 30
		SEC. 3. ERIE.			
647	F. and H. Jones	Contract 14	$900 00	$120 87	$1,020 87
649	Helen O. Hodge	Contract 14	75 00	9 00	84 00
651	Mary L. Null	Contract 14	3,000 00	395 51	3,395 51
657	J. Salem Snell	Contract 14	884 25	110 18	994 43
658	Clarence H. Crow	Contract 14	1,022 38	152 58	1,174 96
660	R. and L. Snyder	Contract 14	494 55	83 84	578 39
662–663	J. C. and C. Redmun	Contract 14	450 00	78 34	528 34
664	W. C. and M. S. Wagner	Contract 14	279 60	40 40	320 00
673	Caroline M. Lip	Contract 14	1,046 00	128 10	1,174 10
716	Lester J. Bauder	Contract 14	125 00	17 65	142 65
520	Anna M. Post, Ind	Contract 17	437 10	70 13	507 23
221–522	C. L. Lotridge and John I. McClempha	Contract 17	75 00	11 80	86 80
			$8,788 88	$1,218 40	$10,007 28

		Sec. 4. Erie.			
533	Henry A. Winnie, assignee	Contract 18	$150 00	$26 21	$176 21
573	Daniel W. Place, et al	Contract 18	450 00	68 05	518 05
576	John L. Smith	Contract 18	1,400 00	204 82	1,604 82
630-632-635	M. E. Van Wormer and T. H. Owens	Contract 18	2,500 00	350 55	2,850 55
631	Louisa E. Hilligar	Contract 18	100 00	12 93	112 93
1801	W. H. & L. M. Waterbury	Contract 30	900 00	38 47	938 47
			$5,500 00	$701 03	$6,201 03
		Sec. 5. Erie.			
199-833	O. C. and L. C. Tuttle	Contract 4	$3,800 00	$660 30	$4,460 30
601	Wm. W. Warner	Contract 4	342 26	56 30	398 56
162-602	Thos. H. and Kate E. Sears	Contract 4	250 00	57 24	307 24
159-159A	Chas. E. Brown, individually	Contract 4	801 16	....	801 16
185-186	Samuel A. and Sarah A. Phelps	Contract 4	800 00	194 83	994 83
165-165A	J. P. and Nellie Brown	Contract 4	125 00	31 38	156 38
993	L. Lafevre	Contract 55	1,100 00	38 52	1,138 52
994	Chas. Hooper, assignee	Contract 55	2,400 00	125 46	2,525 46
1000	Nathan Billinger	Contract 55	4,800 00	321 93	5,121 93
1004	Mary E. Miller	Contract 55	100 00	6 76	106 76
1002	Elizabeth Abbuhl	Contract 55	50 00	5 08	55 08
1112	Eliza Cornish	Contract 55	3,400 00	148 11	3,548 11
1119	Geo. and Felecia Platt	Contract 55	1,400 00	57 76	1,457 76
1056	F. F. and L. E. Hurbut	Contract 55	2,850 00	212 22	3,062 22
1125	Janett Ernst	Contract 55	2,200 00	93 67	2,293 67
1141	F. and G. Harrington	Contract 55	2,500 00	103 15	2,603 15
1152	Owen D. Jones, et al	Contract 55	1,100 00	70 52	1,170 52
1157	Hugh and Alma Evans	Contract 55	1,700 00	70 42	1,770 42
1151	W. W. and A. S. Norton	Contract 55	275 00	8 63	283 63
1127-1132-991A	Albert E. and Jennie Walsworth	Contract 55	16,782 84	1,392 03	18,174 87
1326	Gertrude and Mary L. Jones	Contract 55	1,300 00	53 85	1,353 85
1327	Victoria E. Nesbit	Contract 55	1,600 00	47 60	1,647 60
1330	Geo. W. Winchell, et al	Contract 55	1,600 00	103 63	1,703 63
1003-1005	Angeline Huks	Contract 55	8,100 00	627 30	8,727 30
1680	Andrew J. Sly, et al	Contract 55	1,300 00	9 19	1,309 19
1888	Chas. and Jane Fuller	Contract 55	900 00	23 82	923 82
1901	G. G. and M. A. McIntosh	Contract 55	1,400 00	56 38	1,456 38
1905	G. G. and M. A. McIntosh	Contract 55	1,600 00	42 87	1,642 87
1907	Anna Kane	Contract 55	3,000 00	120 82	3,120 82
1910	First Methodist Episcopal Church, Town of Lee	Contract 55	7,200 00	294 70	7,494 70
1912	Elizabeth Watson	Contract 55	1,000 00	31 40	1,031 40
			$75,776 26	$5,065 87	$80,842 13

STATEMENT SHOWING EXPENDITURES, ETC.,—(*Continued*).

Map number.	NAME.	Section.	Amount.	Interest.	Total.
		SEC. 6. ERIE.			
227–847	Chauncy Brown	Contract 12	$1,500 00	$122,40	$1,622 40
246	Mary Winters	Contract 12	400 92	41 91	442 83
249	Frederick Glask, et al	Contract 12	4,511 84	496 93	5,008 77
251	J. F. and E. Dutcher	Contract 12	564 66	64 51	629 17
258	Lydia M. Brownell	Contract 12	306 95	....	306 95
789	Carrie B. Munzer	Contract 45	1,800 00	12 13	1,812 13
807	Thos. B. and N. E. Preston	Contract 45	2,400 00	228 82	2,628 82
823	Edward Dixon	Contract 45	4,445 56	455 38	4,900 94
			$15,929 93	$1,422 08	$17,352 01
		SEC. 7. ERIE.			
757	H. E. and F. E. Bratt	Contract 12	$1,200 00	$168 46	$1,368 46
		SEC. 8. ERIE.			
1263	W. and M. A. Hier	Contract 47	$4,500 00	$252 49	$4,252 49
1359	Catherine Lake	Contract 47	1,600 00	118 09	1,718 09
1451	I. E. and E. R. Smith	Contract 47	4,500 00	235 23	4,735 23
1532	Mary Ann McMath	Contract 47	3,000 00	124 77	3,124 77
			$13,100 00	$730 58	$13,830 58
		SEC. 9. ERIE.			
1466	John H. King	Contract 6	$150 00	$4 63	$154 63
929	Katherine Mac Moore, et al	Contract 60	1,100 00	93 30	1,193 30
937	Alliance Bank, Rochester	Contract 60	4,500 00	336 58	4,836 58
982	J. E. and J. C. Hoy	Contract 60	3,600 00	305 36	3,905 36
984	W. S. and H. M. Crowell	Contract 60	1,400 00	99 19	1,499 19
1034	Arthur J. Scriber	Contract 60	4,800 00	220 93	5,020 93
1360, 1361	Chas. F. and Mary L. Austin	Contract 41	5,000 00	241 64	5,241 64
1098	Henry E. McArthur	Contract 61	3,000 00	118 85	3,118 85
1095	Sarah Stanley	Contract 61	4,000 00	188 06	4,188 06
1504	Lota B. McArthur	Contract 61	50 00	2 30	52 30
1507	Delbert A. Adams, assignee	Contract 61	800 00	27 88	827 88
			$28,400 00	$1,638 72	$30,038 72

		SEC. 10. ERIE.			
764	J. N. and P. Reed	Contract 9	$1,950 00	$236 56	$2,186 56
765	John Waters, et al	Contract 9	1,500 00	152 38	1,652 38
835	Francis Robinson	Contract 9	675 00	70 79	745 79
873	A. J. and E. J. Parish	Contract 9	75 00	9 95	84 95
24–25	Thos. W. and Mary J. Furlong	Contract 40	1,204 49	....	1,204 49
26	Margaret Furlong	Contract 40	200 00	7 13	207 13
1320	Canal Quary Co	Contract 40	20,000 00	864 66	20,864 66
1311–27	G. A. and C. W. Fetterman	Contract 40	5,000 00	309 86	5,309 86
1458	Hannah Dunninger	Contract 40	1,200 00	44 98	1,244 98
1462	Thos, Mary J and Emma May	Contract 40	236 92	16 05	252 97
1460	M. and T. Roach	Contract 40	3,500 00	260 06	3,760 06
1463	Myrtle I. Lederhouse	Contract 40	100 00	5 41	105 41
957	John Crowley, et al	Contract 64	3,400 00	283 92	3,683 92
1166	Wm. and Emiline Brown	Contract 64	75 00	3 80	78 80
1169	Flora Hunt Jackson	Contract 64	50 00	2 52	52 52
1163	Geo. W. and Jennie Bennett	Contract 64	1,200 00	79 10	1,279 10
1171	J. L. and W. Mack	Contract 64	3,300 00	166 00	3,466 00
1172	Inez Mather	Contract 64	300 00	22 83	322 83
1170	Emily N. Thompson	Contract 64	71 75	6 22	77 97
1374	Independent Union Telephone Co	Contract 64	26,000 00	....	26,000 00
1051	I. J. and R. M. Perkins	Contract 66	1,400 00	101 26	1,501 26
1105	J. and E. J. Dumville	Contract 66	1,200 00	69 24	1,269 24
1187	Wm. C. and Anna M. Hofret	Contract 66	40 00	2 08	42 08
1188	J. H. and H. M. Morningstar	Contract 66	400 00	18 67	418 67
1195	Mary Degan	Contract 66	2,200 00	138 83	2,338 83
1246	John T. and Elizabeth Dunbar	Contract 66	3,800 00	239 87	4,039 87
			$79,078 16	$3,112 17	$82,190 33
		SEC. 11. ERIE.			
3	Mary Bush, et al	Contract 19	$500 00	$65 75	$565 75
606	Thos. May, jr. and Emma May	Contract 19	163 08	29 43	192 51
1825	Catherine Art	Contract 19	1,100 00	52 80	1,152 80
1855	Jacob and Dorothy Kramer	Contract 19	400 00	15 52	415 52
			$2,163 08	$163 50	$2,326 58
		SEC. 1. CHAMPLAIN.			
1073, 1078, 1082	C. E. and I. F. Buslon	Contract 68	$2,700 00	$192 62	$2,892 62
	Carrie H. Wetsie	Contract 68	4,800 00	295 10	5,095 10
			$7,500 00	$487 72	$7,987 72

STATEMENT SHOWING EXPENDITURES, ETC.— (*Continued*).

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 2. CHAMPLAIN.				
61	W. D. and E. W. Stevenson	Contract 1	$861 75	$181 90	$1,043 65
114	A. F. and S. F. Newhols	Contract 3	800 00	246 93	1,046 93
137	Erastus Bristol, et al	Contract 3	29 00	9 48	38 48
974	John and Bridget Skelly	Contract 3	25 00	2 48	27 48
1009–1010, 1011	Fort Miller Pulp and Paper Co	Contract 3	5,000 00	1,467 95	6,467 95
503	Edwin L. Baldwin, et al	Contract 27	1,500 00	255 45	1,755 45
			$8,215 75	$2,164 19	$10,379 94
	SEC. 3. CHAMPLAIN.				
376	Morgan B. Griswold, agent	Contract 15	$9,000 00	$1,881 86	$10,881 86
330–331	Cynthia Fuller	Contract 15	1,700 00	309 91	2,009 91
379	Anna M. Douglass, et al	Contract 15	4,300 00	827 00	5,127 00
696	Byron D. Jackett	Contract 15	3,200 00	582 84	3,782 84
404	Alfred W. Blowen, trustee	Contract 25	350 00	61 73	411 73
410	Chas. H. White	Contract 25	2,444 60	422 36	2,866 96
412	Leonard Wells and Griffin Lumber Co	Contract 25	1,337 05	216 50	1,553 55
			$22,331 65	$4,302 20	$26,633 85
	OSWEGO CANAL.				
686	Kate Wolfe	Contract 10	$2,400 00	$318 77	$2,718 77
1380	Ann Carney	Contract 10	1,600 00	328 77	1,928 77
1381	Edward Simpson	Contract 10	875 00	155 91	1,030 91
			$4,875 00	$803 45	$5,678 45

TEMPORARY DAMAGES.

	SEC. 5. ERIE.				
	Geo. B. White	Contract 44	$25 00	....	$25 00
	Thos. Carroll	Contract 55	30 00	....	30 00
			$55 00	....	$55 00

SUMMARY.

ERIE CANAL.

Canal.	Amount.	Interest.	Total.
Sec. 1............	$2,600 00	$232 77	$2,832 77
Sec. 2............	277,507 15	2,038 15	279,545 30
Sec. 3............	8,788 88	1,218 40	10,007 28
Sec. 4............	5,500 00	701 03	6,201 03
Sec. 5............	75,831 26	5,065 87	80,897 13
Sec. 6............	15,929 93	1,422 08	17,352 01
Sec. 7............	1,200 00	168 46	1,368 46
Sec. 8............	13,100 00	730 58	13,830 58
Sec. 9............	28,400 00	1,638 72	30,038 72
Sec. 10............	79,078 16	3,112 17	82,190 33
Sec. 11............	2,163 08	163 50	2,326 58
Total Erie Canal.	$510,098 46	$16,491 73	$526,590 19

CHAMPLAIN CANAL.

Canal.	Amount.	Interest.	Total.
Sec. 1............	$7,500 00	$487 72	$7,987 72
Sec. 2............	8,215 75	2,164 19	10,379 94
Sec. 3............	22,331 65	4,302 20	26,633 85
Total Champlain Canal........	$38,047 40	$6,954 11	$45,001 51
Oswego Canal	$4,875 00	$803 45	$5,678 45
Total Erie, Champlain and Oswego Canals...	$553,020 86	$24,249 29	$577,270 15

STATEMENT SHOWING EXPENDITURES THROUGH JUDGMENTS OF THE COURT OF CLAIMS FOR LANDS APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS, UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 2. ERIE				
285	Henry Schocki	Contract 8	$615 00	$2 05	$617 05
	SEC. 4. ERIE.				
622	David and Margaret Cramer	Contract 18	$3,650 13	$12 17	$3,662 30
570	S. A. and E. Simmons	Contract 18	212 10	71	212 81
398	Jas. and Marie Trumpha	Contract 18	286 04	95	286 99
574	John Fincour, Sr	Contract 18	205 71	69	206 40
620–621	Margaret E. Green	Contract 18	3,441 79	11 47	3,453 26
			$7,795 77	$25 99	$7,821 76
	SEC. 5. ERIE.				
992	Carrie E. Smith	Contract 55	$3,835 31	$12 78	$3,848 09
1135	Wm. G. Dennison	Contract 55	14,618 79	48 73	14,667 52
			$18,454 10	$61 51	$18,515 61
	SEC. 6. ERIE.				
220	C. Caine and G. W. Heagle, Jr	Contract 12	$2,026 55	$6 75	$2,033 30
272	M. V. Barnum, et al	Contract 12	6,393 74	21 31	6,415 05
748	Hannah D. Tinker	Contract 45	2,938 05	9 79	2,947 84
801	E. A. and E. Darrow	Contract 45	2,157 67	7 19	2,164 86
806	Margaret McCabe	Contract 45	676 00	2 25	678 25
795	Cora A. Miller	Contract 45	1,086 83	3 62	1,090 45
823	G. W. Baker and A. W. Tappan	Contract 45	951 27	3 17	954 44
			$16,230 11	$54 08	$16,284 19

	SEC. 7. ERIE.				
88	Sarah D. Lewis	Contract 5	$273 92	$0 91	$274 83
96	John and Mary Murray	Contract 5	1,371 51	4 57	1,376 08
97	S. and I. Paterson	Contract 5	547 69	1 83	549 52
891	Lewis M. Bennett	Contract 5	1,507 75	5 03	1,512 78
			$3,700 87	$12 34	$3,713 21
	SEC. 9. ERIE.				
72	Janette E. McKee	Contract 6	$12,453 61	$41 51	$12,495 12
275	W. and E. Frank	Contract 6	2,157 73	7 19	2,164 92
85–208	Mary W. Burchard	Contract 6	1,555 63	5 18	1,560 81
1256	Frank Campbell	Contract 61	1,334 79	4 45	1,339 24
			$17,501 76	$58 33	$17,560 09
	SEC. 11. ERIE.				
19	John and Mary Shetrum	Contract 19	$1,143 17	$3 81	$1,146 98
20	Katherine Seefried, et al	Contract 19	105 40	35	105 75
41	Chas. Lureman	Contract 19	77 91	26	78 17
750	Wm. Dornfield	Contract 19	1,802 47	6 01	1,808 48
751	Albert and Robert Dornfield	Contract 19	1,189 53	3 96	1,193 49
1343	Katherine Seefried, et al	Contract 19	4,202 15	14 01	4,216 16
1747	Chas. Lureman	Contract 19	703 18	2 34	705 52
			$9,223 81	$30 74	$9,254 55
	SEC. 2. CHAMPLAIN.				
125	Geo. and Catherine Rice	Contract 3	$385 70	$1 29	$386 99
482	W. H. and L. V. Newton	Contract 27	5,435 88	18 12	5,454 00
483	James E. Laraway, et al	Contract 27	4,329 03	14 43	4,343 46
484	Lemuel W. Burton	Contract 27	1,371 12	4 57	1,375 69
484	Lemuel W. Burton, et al	Contract 27	1,584 51	5 28	1,589 79
485	O. and A. Goodson	Contract 27	3,255 58	10 85	3,266 43
486	W. H. and L. V. Newton	Contract 27	2,788 68	9 29	2,797 97
487	A. K. and J. D. Griffin	Contract 27	405 24	1 35	406 59
488	Almon Griffin	Contract 27	516 79	1 72	518 51
491	John J. and Mary A. Hanley	Contract 27	2,243 27	7 48	2,250 75
498	W. R. and G. G. Ottman	Contract 27	3,666 19	12 22	3,678 41
512	Antoinette Linendoll	Contract 27	4,547 86	15 16	4,563 02
627	Frank and Ida S. Goodrich	Contract 27	2,010 17	6 70	2,016 87
1054	C. L. and R. H. Holman	Contract 27	2,475 46	8 25	2,483 71
			$35,015 48	$116 71	$35,132 19

STATEMENT SHOWING EXPENDITURES, ETC.— (*Continued*).

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 3. CHAMPLAIN.				
337	Maggie Kinner	Contract 15	$2,385 34	$7 95	$2,393 29
338	Walter and Margaret Balch	Contract 15	1,175 33	3 92	1,179 25
339	Maggie Kinner	Contract 15	821 50	2 74	824 24
342	D. and C. Bartholomew	Contract 15	7,639 66	25 46	7,665 12
326	Aquilla Smead	Contract 15	2,423 00	8 08	2,431 08
341	H. A. Leland and M. J. Brown, admrs	Contract 15	1,834 82	6 12	1,840 94
346A	Sarah E. Brown	Contract 15	4,076 06	13 59	4,089 65
356	H. C. and A. Taft	Contract 15	1,198 19	3 99	1,202 18
357	Mary J. Vayette	Contract 15	329 08	1 10	330 18
371	Peter La More	Contract 15	725 30	2 42	727 72
373	Josephine De Lora	Contract 15	1,450 60	4 83	1,455 43
381	Roxanna L. Peters	Contract 15	1,571 48	5 24	1,576 72
364	M. and C. Wheeler, guardians	Contract 15	846 18	2 82	849 00
397	Patrick Horan	Contract 15	2,014 55	6 71	2,021 26
694	Geo. B. Britt, et al	Contract 15	2,325 70	7 75	2,333 45
694	John Ryan	Contract 15	594 58	1 98	596 56
423	A. G. and E. Needham	Contract 25	3,082 97	10 28	3,093 25
425	Wm. L. Graham	Contract 25	2,655 30	8 85	2,664 15
430	John and Eliza Bauer	Contract 25	1,095 28	3 65	1,098 93
432	W. P. and G. Blaisdell	Contract 25	1,238 94	4 11	1,238 05
427	J. and B. J. Lindsay	Contract 25	632 00	2 11	634 11
428	Elizabeth H. Coleman	Contract 25	632 72	2 11	634 83
434-825	C. T. and H. Wright	Contract 25	15,977 70	53 26	16,030 96
436, 741-932-1272	G. W. and E. H. Smith	Contract 25	6,656 03	22 19	6,678 22
393	F. F. and R. Carpenter	Contract 25	7,676 50	25 59	7,702 09
473	R. D. and S. Davison	Contract 25	1,250 41	4 17	1,254 58
477-480	John H. Gay, et al	Contract 25	5,286 88	17 62	5,304 50
			$77,591 10	$258 64	$77,849 74
	OSWEGO CANAL.				
297	Nellie Robinson	Contract 10	$837 55	$2 79	$840 34
298	Nellie Robinson and one	Contract 10	239 30	80	240 10
391	Mary P. Emery	Contract 10	949 60	3 17	952 77
392	F. H. and E. Allen	Contract 10	1,780 50	5 94	1,786 44
682	Mary A. Donnelly	Contract 35	362 65	1 21	363 86
861	Warehouse and Realty Co	Contract 35	6,207 00	20 69	6,227 69
			$10,376 60	$31 60	$10,411 20

TEMPORARY DAMAGES.

SEC. 2. CHAMPLAIN.

	Beecher Wells	Contract 1	$350 00	$1 17	$351 17
	Beecher Wells	Contract 1	350 00	1 17	351 17
	Ashley Dickinson	Contract 1	150 00	50	150 50
			$850 00	$2 84	$852 84

SEC. 3. CHAMPLAIN.

377	Granville Telephone Co	Contract 15	$2,000 00	$6 67	$2,006 67

SUMMARY.

ERIE CANAL.

Canal.	Amount.	Interest.	Total.
Sec. 2	$615 00	$2 05	$617 05
Sec. 4	7,795 77	25 99	7,821 76
Sec. 5	18,454 10	61 51	18,515 61
Sec. 6	16,230 11	54 08	16,284 19
Sec. 7	3,700 87	12 34	3,713 21
Sec. 9	17,501 76	58 33	17,560 09
Sec. 11	9,223 81	30 74	9,254 55
Total Erie Canal.	$73,521 42	$245 04	$73,766 46

CHAMPLAIN CANAL.

Sec. 2	$35,865 48	$119 55	$35,985 03
Sec. 3	79,591 10	265 31	79,856 41
Total Champlain Canal	$115,456 58	$384 86	$115,841 44
Oswego Canal	$10,376 60	$34 60	$10,411 20
Total Erie, Champlain and Oswego Canals	$199,354 60	$664 50	$200,019 10

Statement Showing Expenditures under Agreement with Special Examiners and Appraisers for Lands Appropriated and Damages Thereto for the Construction of Erie, Champlain and Oswego Canals under Chapter 147, Laws of 1903, for the Fiscal Year Ended September 30, 1909.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	Sec. 1. Erie.				
54	R. K. Anderson	Contract 11	$2,686 00	$367 80	$3,053 80
19	Bridget Sheridan et al.	Contract 2	1,599 00	....	1,599 00
46	Thos. L. Sheridan	Contract 2	1,499 00	....	1,499 00
42	Delaware & Hudson Company et al.	Contract 2	73,549 32	....	73,549 32
32	Thos. Kennedy	Contract 2	4,700 00	1,210 67	5,910 67
37	Thos. F. Eren	Contract 2	2,750 00	709 28	3,459 28
			$86,783 32	$2,287 75	$89,071 07
	Sec. 2. Erie.				
669	Jacob D. Van Vrankin	Contract 14	$125 00	$10 81	$135 81
666	John V. V. Green	Contract 14	2,933 55	282 58	3,216 13
283	A. F Bradt et al.	Contract 8	1,400 00	241 87	1,641 87
668	G. B. M. Brougham	Contract 14	2,804 25	478 47	3,282 72
			$7,262 80	$1,013 73	$8,276 53
	Sec. 3. Erie.				
659	John S. Gray and one	Contract 14	$832 12	$49 93	$882 05
643	Isaac Conover	Contract 14	4,251 90	358 56	4,610 46
644	Thos. P. Mathewson	Contract 14	800 00	69 30	869 30
			$5,884 02	$477 79	$6,361 81

Statements Showing Expenditures, Etc.— *Continued.*

Map number.	NAME.	Section.	Amount.	Interset.	Total.
	Sec. 4. Erie.				
534	Henry J. Winnie	Contract 18	$700 00	$68 81	$768 81
604	W. L. Billinger (assignee)	Contract 18	900 00	87 14	987 14
542	M. Van Slyke and one (assignee)	Contract 18	650 00	70 52	720 52
572	Willard L. Billinger (assignee)	Contract 18	1,300 00	137 41	1,437 41
397	Chas. Fical	Contract 18	428 00	58 25	486 25
575	John Fineour, Jr	Contract 18	175 00	21 00	196 00
577	A. E. and Roy Lewis	Contract 18	200 00	27 62	227 62
543	J. S. and C. R. Carter	Contract 18	50 00	7 38	57 38
614	Mervin A. Jones	Contract 18	2,800 00	344 29	3,144 29
616	John G. Hoke	Contract 18	1,400 00	172 14	1,572 14
			$8,603 06	$994 56	$9,597 56
	Sec. 5. Erie.				
153	W. W. Loomis et al.	Contract 4	$561 86	$74 28	$636 14
177	Paul Knox	Contract 4	899 00	....	899 00
236	Sylvan Beach Midway Association	Contract 4	150 00	15 39	165 39
			$1,610 86	$89 67	$1,700 53
	Sec. 6. Erie.				
819	Mack Miller Candle Co	Contract 45	$25,000 00	$698 63	$25,698 63
811	Catherine M. Perkins	Contract 45	2,600 00	110 27	2,710 27
797	Mary J. Jennings	Contract 45	1,600 00	71 54	1,671 54
810	Edwin R. Robertson	Contract 45	5,200 00	232 50	5,432 50
809	Clinton S. Carr (assignee)	Contract 45	10,000 00	461 92	10,461 92
231	Nina Y. Everson	Contract 12	30 00	1 34	31 34
234	Lewis Fancher	Contract 12	2,046 00	128 82	2,174 82
799	Jennie H. Jones	Contract 45	2,000 00	105 20	2,105 20
787	Niagara, Lockport and Ontario Power Co	Contract 45	25,000 00	2,396 71	47,396 71
808	Catherine Quinlan	Contract 45	2,400 00	125 06	2.525 06
266	Emmogene Finn and others	Contract 12	1,350 00	118 50	1,468 50
794	Lydia J. Stebbins	Contract 45	1,700 00	96 97	1,796 97
844	Frank S. Batchelder	Contract 12	906 30	42 00	948 30

793	John P. Failing	Contract 15	1,000 00	57 04	1,057 04
221	W. F. Cushing and C. F. King	Contract 12	1,250 00	116 10	1,366 10
800	A. R. and F. R. Failing	Contract 45	1,100 00	65 81	1,165 81
796	Edward and Mary Bube	Contract 45	800 00	48 53	848 53
812	Henry Behling et al.	Contract 45	3,500 00	197 34	3,697 34
801	Helen Welch	Contract 15	1,100 00	70 34	1,170 34
803	Martha B. Veeder	Contract 45	1,400 00	90 67	1,190 67
802	Amelia A. Darrow	Contract 45	1,000 00	66 08	1,066 08
816	Thos. B. Crum	Contract 15	1,000 00	300 49	1,300 49
			$114,982 30	$5,601 86	$120,584 16

SEC. 7. ERIE.

102	Chas. A. Lux	Contract 5	$647 34	$31 06	$678 40
760	C. A. Stevens and one as exrs.	Contract 12	2,000 00	109 15	2,109 15
109-A	Elias B. Fisher	Contract 5	100 00	25 99	125 99
			$2,747 34	$166 20	$2,913 54

SEC. 9. ERIE.

702	Chas. L. Dearcop	Contract 6	$1,700 00	$89 98	$1,789 98
315	Louise Kitzel	Contract 6	704 55	84 42	788 97
1227	D. R. and L. B. Hasford	Contract 60	2,300 00	68 81	2,368 81
1064	D. A. and L. C. Adams	Contract 61	5,000 00	226 03	5,226 03
			$9,704 55	$469 24	$10,173 79

SEC. 10. ERIE.

836	Chas. A. Cutts	Contract 9	$1,000 00	$55 72	$1,055 72
775	James F. Bennett and one	Contract 9	4,200 00	290 66	4,490 66
			$5,200 00	$346 38	$5,546 38

SEC. 11. ERIE.

550	Chas. Kurth	Contract 19	$200 00	$21 04	$221 04
605	Anna King	Contract 19	500 00	47 26	547 26
			$700 00	$68 30	$768 30

STATEMENTS SHOWING EXPENDITURES, ETC.— *Concluded.*

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	OSWEGO CANAL.				
580	Fulton Fuel and Light Co	Contract 10	$500 00	$56 30	$556 30
	SEC. 2. CHAMPLAIN.				
515	Adelbert H. Snyder	Contract 26	$886 00	$40 05	$926 05
121	Eliza Christie et al	Contract 3	60 00	13 22	73 22
507	Lillian C. Buckley, exs	Contract 27	2,300 00	303 98	2,603 98
60	Susan Pike	Contract 1	60 00	10 23	70 23
59	B. F. Metcalf et al	Contract 1	100 00	17 24	117 24
142	Boyer E. Haviland	Contract 3	550 00	137 24	687 24
501	Elizabeth Williams and one (guardian)	Contract 27	1,750 00	256 31	2,006 31
506	Edgar L. Potter	Contract 27	300 00	43 94	343 94
502	Laura N. Kennedy	Contract 27	1,551 25	227 46	1,778 71
			$7,557 25	$1,049 67	$8,606 92
	SEC. 3. CHAMPLAIN.				
411	Chas. W. Cook	Contract 25	$775 00	$73 38	$848 38
380	J. Sanford Potter, exr	Contract 15	4,500 00	556 27	5,056 27
603	Elen M. Virgil	Contract 15	1,800 00	203 87	2,003 87
362	Delor Gordon	Contract 15	600 00	78 70	673 70
366	Antiono and Mary Russo	Contract 15	700 00	91 48	791 48
367	Chas. Eaton	Contract 15	800 00	104 55	904 55
329	Stephen V. R. Rathbun	Contract 15	1,400 00	188 72	1,588 72
344	Frank Johnson et al	Contract 15	3,268 30	470 63	3,738 93
406	I. V. Baker	Contract 25	100 00	13 68	113 68
715	Elizabeth S. Holcomb	Contract 15	1,600 00	143 60	1,743 60
353	Willie G. Fisher	Contract 15	3,307 50	494 78	3,802 28
363	Wm. Horton	Contract 15	1,250 00	202 18	1,452 18
332	Wallace R. Kinner	Contract 15	1,600 00	252 30	1,852 30
328	Wm. S. Smith (adms.)	Contract 15	1,350 00	229 91	1,579 91
			$23,050 80	$3,104 05	$26,154 85

SUMMARY.

CANAL.	Amount.	Interest.	Total.
Section 1, Erie	$86,783 32	$2,287 75	$89,071 07
Section 2, Erie	7,262 80	1,013 73	8,276 53
Section 3, Erie	5,884 02	477 79	6,361 81
Section 4, Erie	8,603 00	994 56	9,597 56
Section 5, Erie	1,610 86	89 67	1,700 53
Section 6, Erie	114,982 30	5,601 86	120,584 16
Section 7, Erie	2,747 34	166 20	2,913 54
Section 9, Erie	9,704 55	469 24	10,173 79
Section 10, Erie	5,200 00	346 38	5,546 38
Section 11, Erie	700 00	68 30	768 30
	$243,478 19	$11,515 48	$254,993 67
Section 2, Champlain	$7,557 25	$1,049 67	$8,606 92
Section 3, Champlain	23,050 80	3,104 05	26,154 85
	$30,608 05	$1,153 72	$34,761 77
Oswego Canal	$500 00	$56 30	$556 30
Total, Erie, Champlain and Oswego canals	$274,586 24	$15,725 50	$290,311 74

STATEMENT SHOWING EXPENDITURES THROUGH JUDGMENTS OF THE COURT OF CLAIMS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1909.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 1. ERIE.				
30A	Margaret Kennedy	Contract 2	$2,883 05	$9 61	$2,892 66
44	David Gregg	Contract 2	15,747 62	52 49	15,800 11
			$18,630 67	$62 10	$18,692 77
	SEC. 5. ERIE.				
195	Joseph S. Cottman	Contract 4	$6,736 80	$22 45	$6,759 25
183A	Wm. H. Lindsley	Contract 4	2,719 93	9 06	2,728 99
196	D. H. and F. J. Hager	Contract 4	5,195 25	17 32	5,212 57
			$14,651 98	$48 83	$14,700 81
	SEC. 7. ERIE.				
	Sylvester W. Treat	Contract 12	$40 00	13	$40 13
	SEC. 9. ERIE.				
63	H. and C. P. Kuhn	Contract 6	$947 02	$3 16	$950 18
Temporary	Joseph Remers	Contract 6	141 67	42	142 09
			$1,088 69	$3 58	$1,092 27
	SEC. 2. CHAMPLAIN.				
143	Sarah A. Thorpe	Contract 3	$1,818 00	$6 06	$1,824 06

SEC. 3. CHAMPLAIN.

151	Julia A. Kinner	Contract 15	$1,460 55	$4 87	$1,465 42
377	Village of Whitehall	Contract 15.	15,043 17	50 14	15,093 31
			$16,503 72	$55 01	$16,558 73

OSWEGO.

	Joseph H. Conners	Contract 10	$110 00	$0 37	$110 37

SUMMARY.

CANAL.	Amount.	Interest.	Total.
ERIE CANAL.			
Section 1	$18,630 67	$62 10	$18,692 77
Section 5	14,651 98	48 83	14,700 81
Section 7	40 00	13	40 13
Section 9	1,088 69	3 58	1,092 27
	$34,411 34	$114 64	$34,525 98
CHAMPLAIN CANAL.			
Section 2	$1,818 00	$6 06	$1,824 06
Section 3	16,503 72	55 01	16,558 73
	$18,321 72	$61 07	$18,382 79
OSWEGO CANAL.	$110 00	$0 37	$110 37
Total Erie, Champlain and Oswego canals	$52,843 06	$176 08	$53,019 14

STATEMENT SHOWING EXPENDITURES UNDER AGREEMENT WITH SPECIAL EXAMINER AND APPRAISER FOR LANDS APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1908.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 1. ERIE.				
23	Hugh McAron	Contract 2	$1,299 00		$1,299 00
48	Gordon C. Carpenter	Contract 2	124 00		124 00
49	Catherine L. Hardenbrook	Contract 2	274 00		274 00
201	T. Ribirdy et al	Contract 11	2,200 00	$220 96	2,420 96
31A	Jennie McKaller	Contract 2	4,300 00	669 39	4,969 39
47	Louis R. Breslin	Contract 2	1,350 00	274 51	1,624 51
52	Gordon C. Carpenter	Contract 2	99 00		99 00
			$9,646 00	$1,164 86	$10,810 86
	SEC. 2. ERIE.				
288	Mary Phillips Patton	Contract 8	$5,200 65	$418 89	$5,619 54
	Wm. McMourn	Contract 8	1,146 95	120 28	1,267 23
289	John D. and Ida R. Wilde	Contract 8	1,638 37	5 46	1,643 83
			$7,985 97	$544 63	$8,530 60
	SEC. 3. ERIE.				
519	Christian F. Auspelmeyer	Contract 17	$400 00	$29 00	$429 00
	SEC. 4. ERIE.				
532	Hattie Zoller, guardian	Contract 18	$600 00	$39 75	$639 75
529	Chas. R. Coster	Contract 18	400 00	27 95	427 95
544 and 545	Henry J. Winnie, assignee	Contract 18	70 00	5 54	75 54
399	Clarence H. Crouse	Contract 18	424 50	37 47	461 97
396 and 400	John S. Gray	Contract 18	4,000 00	359 78	4,359 78
539 and 578	Henry J. Winnie, assignee	Contract 18	1,850 00	148 22	1,998 22
			$7,344 50	$618 71	$7,963 21

SEC. 5. ERIE.

175	Anna P. Batchelor	Contract 4	$134 00		$134 00
191	Theodore D. Allen	Contract 4	300 00	$34 67	334 67
174	A. E. Wetherbee and G. E. Wilson	Contract 4	299 00		299 00
167	Isaac Kent	Contract 4	159 00		159 00
167A	Isaac Kent	Contract 4	40 00	1 47	41 47
176	James Moore, attorney	Contract 4	624 00		624 00
599	Royal J. Yager	Contract 4	100 14	3 49	103 63
156	Georgianna Bowmister	Contract 4	1,600 00	170 43	1,770 43
173A	H. G. Rogers and J. R. Calkins, attorneys	Contract 4	2,400 00	350 33	2,750 33
160A	Virgel W. Tremain	Contract 4	91 41	4 08	95 49
597	G. Banister and C. M. Town	Contract 4	275 00	11 12	286 12
171B	Hannon G. Roberts	Contract 4	2,824 00		2,824 00
181	Iniz Spencer et al	Contract 4	525 97	47 03	573 00
385	David D. Barber	Contract 4	1,500 00	159 53	1,659 53
			$10,872 52	$782 15	$11,654 67

SEC. 7. ERIE.

98	Estella Mary Osburn, administratrix	Contract 5	$2,300 00	$297 17	$2,597 17

SEC. 9. ERIE.

77 and 308	Florence G. Beckwith	Contract 6	$5,300 00	$556 24	$5,856 24
76	Edmund R. Fry, administrator	Contract 6	99 00		99 00
317	Edmund R. Fry, administrator	Contract 6	100 00	8 19	108 19
698	Henry Kuhn	Contract 6	498 60	14 59	513 19
316	Town of Gates, Monroe county	Contract 6	175 00	18 98	193 98
79	New York Central & Hudson River Railroad	Contract 6	14,193 00		14,193 00
			$20,365 60	$598 00	$20,963 60

SEC. 11. ERIE.

551	John Ricker	Contract 19	$643 43	$40 92	$684 35

SEC. 2. CHAMPLAIN.

133	John S. Kelly	Contract 3	$153 25	$23 55	$176 80
62	Anna M. Brayman	Contract 1	1,000 00	96 33	1,096 33
505	Nicholas J. McLutyse	Contract 27	1,500 00	79 40	1,579 40
112	Nathaniel Carswell	Contract 3	418 20		418 20
116½	Mary J. Dodd	Contract 3	369 30		369 30
58	Wm. Turner	Contract 1	200 00	21 21	221 21
494	Albert K. Johnson	Contract 27	2,000 00	135 12	2,135 12

STATEMENT SHOWING EXPENDITURES WITH SPECIAL EXAMINER — (*Concluded*).

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 2. CHAMPLAIN—(*Concluded*).				
569	Elizabeth Hogan	Contract 27	$1,800 00	$121 61	$1,921 61
115	Serene De Germo	Contract 3	300 00	53 95	353 95
119A	Francis J. Petit	Contract 3	800 00	144 00	944 00
			$8,540 75	$675 17	$9,215 92
	SEC. 3. CHAMPLAIN.				
378	Louis and Laura Paletz	Contract 15	$4,000 00	$221 59	$4,221 59
369	Joseph Blanchard	Contract 15	2,400 00	182 27	2,582 27
393B	Isaac V. Baker, Jr	Contract 25	320 00	10 25	330 25
368	Marie L. Gordon	Contract 15	850 00	71 96	921 96
358	Susan Montena	Contract 15	500 00	48 99	548 99
372	Frank Gordon	Contract 15	1,135 00	103 18	1,238 18
405	Mary A. Sullivan	Contract 25	1,000 00	77 26	1,077 26
695	Zeb. Raymond	Contract 15	1,400 00	156 03	1,556 03
			$11,605 00	$871 53	$12,476 53
	SEC. 1. OSWEGO.				
556	Isabella Y. Parker	Contract 10	$600 00	$33 04	$633 04
306	Jack Miller	Contract 10	35 00	3 24	38 24
306	Lawrence Van Buren	Contract 10	125 00	12 61	137 61
559	Ellen Baldwin	Contract 10	1,000 00	63 29	1,063 29
560	Anna Printy	Contract 10	250 00	15 82	265 82
564	Lester Baldwin	Contract 10	175 00	11 08	186 08
586	Lena Kennedy	Contract 10	1,700 00	100 32	1,800 32
561	Wm. Caffrey	Contract 10	350 00	24 22	374 22
563	Mary Ann Caffrey	Contract 10	1,300 00	89 97	1,389 97
770	Helen T. Gorge and one	Contract 10	500 00	39 45	539 45
562	Mary Parker and one	Contract 10	675 00	53 26	728 26
			$6,710 00	$446 30	$7,156 30

SUMMARY.

CANAL.	Amount.	Interest.	Total.
ERIE CANAL.			
Section 1	$9,646 00	$1,164 86	$10,810 86
Section 2	7,985 97	544 63	8,530 60
Section 3	400 00	29 00	429 00
Section 4	7,344 50	618 71	7,963 21
Section 5	10,872 52	782 15	11,654 67
Section 7	2,300 00	297 17	2,597 17
Section 9	20,365 60	598 00	20,963 60
Section 11	643 43	40 92	684 35
Total — Erie canal	$59,558 02	$4,075 44	$63,633 46
CHAMPLAIN CANAL.			
Section 2	$8,540 75	$675 17	$9,215 92
Section 3	11,605 00	871 53	12,476 53
Total — Champlain canal	$20,145 75	$1,546 70	$21,692 45
Oswego canal	$6,710 00	$446 30	$7,156 30
Total — Erie, Champlain and Oswego canals	$86,413 77	$6,068 44	$92,482 21

Statement Showing Expenditures through Judgments of the Court of Claims for Land Appropriated and Damages Thereto for the Construction of the Erie, Champlain and Oswego Canals under Chapter 147, Laws of 1903, for the Fiscal Year Ended September 30, 1908.

Map number.	NAME. [Through Court of Claims.]	Section.	Amount.	Interest.	Total.
	Sec. 1. Erie.				
37–38	Sarah R. Eurr	Contract 2	$11,171 85	$37 23	$11,209 08
34	C. A. and F. M. Sulzman	Contract 2	12,396 70	41 32	12,438 02
8	Cora B. Grant	Contract 2	3,505 50	11 68	3,517 18
1–14	Jennie Bush	Contract 2	29,554 75	98 51	29,653 26
			$56,628 80	$188 74	$56,817 54
	Sec. 2. Erie.				
Temporary	John D. Wilde	Contract 8	$70 00	$0 23	$70 23
289	J. D. and I. R. Wilde	Contract 8	820 65	2 74	823 39
			$890 65	$2 97	$893 62
	Sec. 3. Erie.				
40	Henrietta P. Carmichael	Contract 17	$20,440 83	$68 13	$20,508 96
	Sec. 5. Erie.				
180	Jennie E. Gale	Contract 4	$150 00	$0 50	$150 50
192	Maud Randall Hill	Contract 4	2,975 83	9 92	2,985 75
			$3,125 83	$10 42	$3,136 25
	Sec. 9. Erie.				
64	W. G. and C. C. Rapp	Contract 6	$2,589 11	$8 63	$2,597 74
66	Geo. W. Payne	Contract 6	2,336 67	7 79	2,344 46
29	G. W. and E. M. Payne	Contract 6	53 94	18	54 12
274	Clara Schurman	Contract 6	488 14	1 63	489 77
Temporary damages	Patrick Lynch	Contract 6	173 95	58	174 53
			$5,641 81	$18 81	$5,660 62

SUMMARY.

CANAL.	Amount.	Interest.	Total.
Erie Canal.			
Section 1	$56,628 80	$188 74	$56,817 54
Section 2	890 65	2 97	893 62
Section 3	20,440 83	68 13	20,508 96
Section 5	3,125 83	10 42	3,136 25
Section 9	5,641 81	18 81	5,660 62
Total Erie canal	$86,727 92	$289 07	$87,016 99

STATEMENT SHOWING EXPENDITURES UNDER AGREEMENT WITH BOARD OF SPECIAL EXAMINERS AND APPRAISERS FOR LANDS APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1907.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 1. ERIE.				
5	George Kelly et al	Contract 2	$1,499 00		$1,499 00
9	John J. Duffy	Contract 2	9,000 00	$794 56	9,791 56
27	Alexander and Rosco Parisi	Contract 2	1,299 00		1,299 00
25	Thomas F. Gaynor	Contract 2	1,499 00		1,499 00
21	John Knickerbocker	Contract 2	2,750 00		2,750 00
2	Thomas E. Robinson	Contract 2	4,500 00		4,500 00
202	A. and R. Chonision	Contract 11	5,800 00	280 31	6,080 31
4	William Macrea	Contract 2	3,000 00	371 34	3,371 34
			$29,347 00	$1,446 21	$30,793 21
	SEC. 5. ERIE.				
188	M. Cavana and F. B. Randall	Contract 4	$499 00		$499 00
17½	J. Wells Crandall	Contract 4	34 00		34 00
160	Virgil W. Tremain	Contract 4	478 93	$19 05	497 98
161	Cyrus S. Tremain	Contract 4	509 21	20 26	529 47
198	New York, Ontario and Western Railroad Co	Contract 4	117,161 66		117,161 66
189	E. Leland Hunt, attorney	Contract 4	800 00	57 60	857 60
			$119,482 80	$96 91	$119,579 71
	SEC. 9. ERIE.				
86	Thomas Reinagel	Contract 6	$1,300 00	$105 82	$1,405 82
276-314	H. M. and E. R. Pratt	Contract 6	900 00	25 16	925 16
82	Rochester Tallow Co	Contract 6	69 00		69 00
277	Mrs. Anna Uhl	Contract 6	250 00	7 04	257 04
70	Charles H. Joslin, as executor	Contract 6	2,599 00		2,599 00
84	Abram Baas	Contract 6	600 00	49 40	649 40
65-209	Anna Richardson et al	Contract 6	3,382 55	444 90	3,827 45
70	Charles H. Joslin, as executor	Contract 6	1,200 00		1,200 00

71	Charles and Margaret Schott	Contract 6	500 00		500 00
369	Charles H. Joslin, as executor	Contract 6	400 00	37 74	437 74
68-312-313	Michael J. Alexander	Contract 6	3,450 00	333 70	3,783 70
			$14,650 55	$1,003 76	$15,654 31

SEC. 2. CHAMPLAIN.

152	Fred. Linendoll	Contract 1	$1,223 80		$1,223 80
147	Alexander Bristol	Contract 1	4,161 00		4,161 00
55	Reed Peck	Contract 1	1,035 00		1,035 00
139	Henry S. Taylor	Contract 3	374 00		374 00
145	Jane Ann Linendoll	Contract 3	849 00	$100 60	949 60
122	Francis M. Bassett	Contract 3	250 00	30 70	280 70
141	School District No. 3, Fort Miller	Contract 3	125 00	15 47	140 47
			$8,017 80	$146 77	$8,164 57

SEC. 1. OSWEGO.

296	Jane E. Waugh	Contract 10	$600 00	$32 65	$632 65

SUMMARY.

CANAL.	Amount.	Interest.	Total.
ERIE CANAL.			
Section 1	$29,347 00	$1,446 21	$30,793 21
Section 5	119,482 80	96 91	119,579 71
Section 9	14,650 55	1,003 76	15,654 31
Total Erie canal	$163,480 35	$2,546 88	$166,027 23
CHAMPLAIN CANAL.			
Total Champlain canal, section 2	$8,017 80	$146 77	$8,164 57
OSWEGO CANAL.			
Total Oswego canal, section 1	$600 00	$32 65	$632 65
Total Erie, Champlain and Oswego canals	$172,098 15	$2,726 39	$174,824 45

STATEMENT SHOWING EXPENDITURES THROUGH JUDGMENTS OF THE COURT OF CLAIMS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1907.

Map number.	NAME.	Section.	Amount.	Interest.	Total.
	SEC. 2. ERIE.				
Temporary damages	William H. Terry	Contract 14	$150 00	$0 50	$150 50
	SEC. 5. ERIE.				
194	William C. Davis	Contract 4	$1,116 83	$3 72	$1,120 55
Temporary damages	Thomas Parry	Contract 4	50 00	17	50 17
			$1,166 83	$3 89	$1,170 72
	SEC. 9. ERIE.				
81-210	James L. Hotchkiss	Contract 6	$9,600 00	$867 20	$10,467 20
Interest	James L. Hotchkiss	Contract 6	....	34 89	34 89
Temporary	Edward J. Richardson	Contract 6	275 00	92	275 92
			$9,875 00	$903 01	$10,778 01
	SEC. 2. CHAMPLAIN.				
130	William Harris	Contract 3	$764 23	$2 55	$766 78
134	Alice H. Chase	Contract 3	310 75	1 03	311 78
			$1,074 98	$3 58	$1,078 56

SUMMARY.

CANAL.	Amount.	Interest.	Total.
ERIE CANAL.			
Section 2	$150 00	$0 50	$150 50
Section 5	1,166 83	3 89	1,170 72
Section 9	9,875 00	903 01	10,778 01
	$11,191 83	$907 40	$12,099 23
CHAMPLAIN CANAL.			
Section 2	$1,074 98	$3 58	$1,078 56
Total Erie, Champlain and Oswego canals	$12,266 81	$910 98	$13,177 79

STATEMENT SHOWING EXPENDITURES UNDER AGREEMENT WITH BOARD OF SPECIAL EXAMINERS AND APPRAISERS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS AND CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1906.

Map No.	NAME.	Section.	Amount.	Total.
	SEC. 1. ERIE.			
3	L. Platt Steenburgh	Contract 2	$3,500 00	$3,500 00
17	Catherine Tunnard	Contract 2	1,200 00	1,200 00
20	Catherine Tunnard	Contract 2	1,800 00	1,800 00
6	Dinah Nelson and Margaret Tunnard	Contract 2	3,000 00	3,000 00
24	Thos. J. Dunn	Contract 2	2,200 00	2,200 00
13	Joseph Guilfoyle	Contract 2	1,800 00	1,800 00
22	Harriett Wolf	Contract 2	1,200 00	1,200 00
7	Peter Hoff	Contract 2	3,200 00	3,200 00
11	Edward Doherty	Contract 2	1,250 00	1,250 00
36	William Davy	Contract 2	2,300 00	2,300 00
14	Richard Galvin	Contract 2	2,000 00	2,000 00
33	John F. and Julia Vogel	Contract 2	1,700 00	1,700 00
10	Henry C. Gaunt	Contract 2	2,500 00	2,500 00
16	E. and M. Kenny	Contract 2	2,500 00	2,500 00
45	Anna R. Wolcott	Contract 2	3,362 00	3,362 00
53	Anna R. Wolcott	Contract 11	7,037 00	7,037 00
215	Anna R. Wolcott	Contract 11	371 00	371 00
43	Ledyard Cogswell	Contract 2	150 00	150 00
18	Johanna A. Meeker	Contract 2	3,700 00	3,700 00
12	Mary H. Higgins	Contract 2	599 00	599 00
51	David Erskin	Contract 2	137 41	137 41
50	Luke Kavanaugh	Contract 2	99 00	99 00
15	Simon and Ellen Hart	Contract 2	1,400 00	1,400 00
26	Thos. L. Sheridan	Contract 2	1,500 00	1,500 00
.....	Waterford Water Works Co	Contract 2	1,973 03	1,973 03
			$50,468 44	$50,468 44
	SEC. 5. ERIE.			
170	Gertrude E. McCanathan	Contract 4	$395 03	$395 03
184	Mary E. Spencer and one	Contract 4	4,274 00	4,274 00
187	Mary E. Spencer and one	Contract 4	2,424 00	2,424 00
155	Wm. W. Warner	Contract 4	1,091 42	1,091 42
166	C. G. Barse	Contract 4	73 10	73 10
190	Catherine Cochran	Contract 4	139 00	139 00
182A	Martin Carana, president	Contract 4	2,682 88	2,682 88
157	S. E. Burdick	Contract 4	895 18	895 18
			$11,974 61	$11,974 61
	SEC. 7. ERIE.			
92	Anna Prittie	Contract 5	$667 97	$667 97
93	Chas. A. Bennett	Contract 5	1,092 92	1,092 92
94	Chas. A. Bennett	Contract 5	755 74	755 74
103	John H. Newton	Contract 5	24 33	24 33
108	Milar Sherman	Contract 5	2,609 93	2,609 93
			$5,150 89	$5,150 89
	SEC. 9. ERIE.			
67	Wallace R. Dix	Contract 6	$5,599 00	$5,599 00
73	Henry M. Pratt	Contract 6	5,899 00	5,899 00
80	Louis Kitzel	Contract 6	1,149 00	1,149 00
71	Chas. and Margaret Schott	Contract 6	4,999 00	4,999 00
83	Wm. H. Booth	Contract 6	331 63	331 63
74	Anna Uhle	Contract 6	2,499 00	2,499 00
79	New York Central & Hudson River Railroad	Contract 6	72,954 00	72,954 00
75	Henry and Catherine Kuhn	Contract 6	2,899 00	2,899 00
			$96,329 63	$96,329 63

Statement Showing Expenditures, Etc. — (*Continued*).

Map No.	NAME	Section.	Amount.	Total.
	Sec. 2. Champlain.			
123	Wm. T. Guy	Contract 3	$1,149 00	$1,149 00
123	Horace L. Rogers	Contract 3	1,099 00	1,099 00
117	Fred C. Bristol	Contract 3	1,299 00	1,299 00
118	Lewis Ketchem	Contract 3	499 00	499 00
136	Edward Baker	Contract 3	224 00	224 00
148	Edgar A. Martin	Contract 1	39 00	39 00
113	Nathaniel Carswell	Contract 3	1,757 30	1,757 30
116	Erastus Bristol	Contract 3	3,499 00	3,499 00
135	Sheldon Viele	Contract 3	74 00	74 00
157	Elizabeth Lowler	Contract 1	575 00	575 00
			$10,214 30	$10,214 30

Partial payments made by appraisers to owners, upon signing agreements for land appropriated:

	Sec. 1. Erie.	
.....	Contract No. 2	$8 00
.....	Contract No. 11	2 00
	Sec. 5. Erie.	
.....	Contract No. 4	12 00
	Sec. 7. Erie.	
.....	Contract No. 5	8 00
	Sec. 9. Erie.	
.....	Contract No. 6	6 00
	Sec. 2. Champlain.	
.....	Contract No. 1	2 00
.....	Contract No. 2	1 00
		$39 00

Summary.

CANAL.	Amount.	Total.
Erie Canal.		
Sec. 1	$50,478 44	$50,478 44
Sec. 5	11,986 61	11,986 61
Sec. 7	5,158 89	5,158 89
Sec. 9	96,335 63	96,335 63
Total — Erie canal	$163,959 57	$163,959 57
Champlain Canal.		
Total — Champlain canal — Sec. 2	$10,217 30	$10,217 30
Total — Erie, Champlain and Oswego canals	$174,176 87	$174,176 87

STATEMENT SHOWING EXPENDITURES THROUGH JUDGMENTS OF THE COURT OF CLAIMS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1906.

Map No.	NAME.	Section.	Amount.	Interest.	Total.
		SEC. 9. ERIE.			
.....	Louis Kitzel, Jr.	Contract 6...	$399 68	$1 33	$401 01

STATEMENT SHOWING EXPENDITURES UNDER AGREEMENT WITH BOARD OF SPECIAL EXAMINERS AND APPRAISERS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1905.

Map number.	NAME	Section.	Amount.	Total.
	SEC. 1. ERIE.			
35........	Mary Laughlin	Contract 2....	$1,500 00	$1,500 00
	Partial payments made by appraisers to owners, upon signing agreements for land appropriated:			
	Contract No. 1, Champlain canal, four parcels	....	....	4 00
	Contract No. 2, Erie canal, sixteen parcels	....	....	16 00
	Contract No. 3, Champlain canal, fifteen parcels	....	....	15 00
	Contract No. 6, Erie canal, seven parcels	....	....	7 00
	Contract No. 4, Erie canal, five parcels.	....	....	5 00
			$1,500 00	$1,547 00

SUMMARY.

CANAL.	Section.	Amount.	Total.
ERIE CANAL.			
Total Erie Canal	Sec. 1........	$1,528 00	$1,528 00
CHAMPLAIN CANAL.			
Total Champlain canal	Sec. 1........	$19 00	$19 00
Total Erie, Champlain and Oswego canals	....	$1,547 00	$1,547 00

STATEMENT SHOWING EXPENDITURES THROUGH JUDGMENTS OF THE COURT OF CLAIMS FOR LAND APPROPRIATED AND DAMAGES THERETO FOR THE CONSTRUCTION OF THE ERIE, CHAMPLAIN AND OSWEGO CANALS UNDER CHAPTER 147, LAWS OF 1903, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1905.

NAME.	Canal.	Amount.	Interest.	Total.
David D. Hughes....................	....	$25 00	$0 08	$25 08
Edward Hughes....................	....	25 00	08	25 08
John M. Davies....................	....	25 00	08	25 08
		$75 00	$0 24	$75 24

SUMMARY.

NAME.	Canal.	Amount.	Interest.	Total.
	ERIE CANAL.			
Total Erie canal....................	Sec. 1........	$75 00	$0 24	$75 24
Total Erie, Champlain and Oswego canals..........................	....	$75 00	$0 24	$75 24

STATEMENT SHOWING THE JUDGMENTS OF THE COURT OF CLAIMS, TOGETHER WITH INTEREST THEREON, PAID DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910, FROM CHAPTER 451, LAWS OF 1909, AND CHAPTER 535, LAWS OF 1910.

ERIE CANAL.

	Amount of judgment.	Amount of interest.
Jay N. Ostrander	$240 00	$0 80
Lottie E. Sherwood and Wallace S. Sherwood	175 00	58
Anthony Kippley	12 00	04
Mary Whalen	75 00	25
Louise M. Morgan and Donald F. McLennan, executors of Carter H. Morgan, deceased	818 50	2 73
David S. Williams and Sophia C. Williams	40 00	13
Barney Abeel and Charles Abeel	650 00	2 17
Christian H. Brege	250 00	18 29
William Brege	250 00	18 29
William F. Brege	75 00	5 48
Fred Bruning	300 00	21 95
Fred W. Buehring	75 00	5 48
Ferdinand Eick	125 00	9 14
Fred Fink	75 00	5 48
William H. Mietz	40 00	2 93
Ara R. Newton	250 00	18 29
Chester A. Post	1,200 00	87 78
Friderike Urtle	100 00	7 32
Augustus Bruning	400 00	29 26
William Bruning	50 00	3 66
Annie Stahl	25 00	1 83
Ferdinand Stahl	100 00	7 32
Fred J. Schultz	50 00	3 66
August Winter	300 00	21 95
Eliza Woolemberg	200 00	14 63
William Zabel	125 00	9 14
Carried forward	$6,000 50	$298 58

	Amount of judgment	Amount of interest.
Brought forward	$6,000 50	$298 58
Herman Brege	400 00	29 26
Fred Eschenburg	325 00	23 77
Albert Frenz	150 00	10 97
Harrison D. Gilbert	150 00	10 97
John Goldwitzel	125 00	9 14
Paul Reamer	150 00	10 97
David C. Ryan and Edward Ryan	400 00	29 26
Howard L. Sprout	540 00	39 50
Charles B. Taylor	100 00	7 32
Fred Woolenberg	150 00	10 97
William Hagen and Rowland J. Lumley	1,500 00	109 73
Rudolph Donner	100 00	7 32
John Giertz, Jr.	150 00	10 97
Paulina Luckman	200 00	14 63
Charles Pafk	350 00	25 60
Fred Reak	300 00	21 95
Lewis Rein	800 00	58 52
The town of Royalton	500 00	36 57
August Scharlau	500 00	36 57
Albert P. Tuttle	600 00	43 89
William Wagoner	200 00	14 63
W. Zimmerman	75 00	5 48
Lewis Smith	150 00	10 97
Friderike Urtle	200 00	14 63
William Smith	200 00	14 63
Lyanan Dewey	200 00	14 63
Anna Stahl	100 00	7 32
Christian H. Brege	225 00	16 46
Fred Fink	75 00	5 48
Fred Bretzenow	100 00	7 32
Wilson H. Rheinhart	860 00	62 91
Herman Bartz	350 00	25 60
William H. Nietz	100 00	7 32
Ferdinand Stahl	100 00	7 32
Harrison D. Gilbert	275 00	20 12
Carried forward	$16,700 50	$1,081 28

	Amount of judgment.	Amount of interest.
Brought forward	$16,700 50	$1,081 28
Willis Luckman	100 00	7 32
Rudulph Bruning	75 00	5 48
August Winter	225 00	16 46
Mary Stahl	75 00	5 48
August Woodstock	300 00	21 95
Ara R. Newton	300 00	21 95
Fred. Garling	75 00	5 48
Fred Fink	1,050 00	76 81
Herman Brege	300 00	21 95
Chester A. Post	1,200 00	87 78
Ferdinand Eick	150 00	10 97
Charles B. Taylor	150 00	10 97
John Goldwitzel	375 00	27 43
Caroline Wagoner	50 00	3 66
Fred F. Blumereich	100 00	7 32
Fred Eschenburg	200 00	14 63
William Brege	200 00	14 63
William Zeble	75 00	5 48
Howard L. Sprout	1,300 00	95 10
David Ryan and Edward Ryan	800 00	58 52
Fred Woolenberg	400 00	29 26
Paul Reamer	100 00	7 32
Emma Turrell	150 00	10 97
Fred J. Schultz	75 00	5 48
Fred Bretzenow and August Winter	150 00	10 97
Henry Winter	200 00	14 63
Fred W. Buehring	200 00	14 63
Eliza Woolenberg	250 00	18 29
August F. Bruning	400 00	29 26
William F. Brege	125 00	9 14
Charles Pogel	100 00	7 32
William Bruning	100 00	7 32
Samuel Baker	275 00	18 85
Henry T. King and Florence King	700 00	47 98
Henry T. King	100 00	6 86
Henry T. King and Florence King	350 00	23 99
Carried forward	$27.475 50	$1,862 92

	Amount of judgment.	Amount of interest.
Brought forward	$27,475 50	$1,862 92
Henry T. King	100 00	6 86
Henry T. King	700 00	47 98
Henry T. King	100 00	6 86
Henry T. King and Florence King	700 00	47 98
George H. Ray	300 00	19 53
Margaret T. S. Riggs	120 00	7 81
Fred Years and Mary Years	600 00	39 06
Charles C. Holtz	183 00	11 91
Fred Race	450 00	29 29
Margaret T. S. Riggs	60 00	3 91
Stephen Reals	95 00	4 44
Ann Casper and Adelbert Reinagle	34 00	1 59
Stephen Reals	50 00	2 33
Robert Mason	54 00	2 52
Jennie Forderkonz	50 00	2 33
Catherine Doxstader	80 00	3 73
Daniel N. Place and James E. Place	60 00	2 80
Clarence H. Crouse	55 00	2 57
Stephen L. Simmons	50 00	2 33
Gregory W. Shea	525 00	24 51
George Straub	104 00	4 85
John A. Lieback	155 00	7 24
Nancy Davison	50 00	2 33
Lilla Alice Emens	100 00	4 67
Stephen A. Simmons	50 00	2 33
Loren W. Angus	85 00	3 97
Olive Hubbs	100 00	4 67
Thomas Copson	10 00	47
Roy C. Baker	20 00	93
Mary C. Winfield	65 00	3 03
Sarah Baker	55 00	2 57
Jessie Copson	5 00	23
Marshal R. Dutton	135 00	6 30
Eric Carlsan	40 00	1 87
Charles W. Collimer and William C. Collimer	50 00	2 33
Carried forward	$32,865 50	$2,181 05

	Amount of judgment.	Amount of interest.
Brought forward	$32,865 50	$2,181 05
Abram J. Kusse	40 00	1 87
Rochester Railway Co	108 57	5 06
Alfred E. Spencer	45 00	2 10
James Lannan	60 00	2 80
Gabriel Hutson	25 00	1 17
Big Elm Stock Farm Supply Co., and John Howard	68 00	3 17
John C. McDonnell and Elizabeth McDonnell	1,400 00	65 36
Matthew E. Butler	95 00	4 44
Elmer Harter, executor of James Harter	41 93	1 90
William H. Maycock	75 00	3 50
John Crowley	165 00	7 13
Mary Coon, administratrix	161 25	6 96
Rolla Dunlap	105 00	4 54
Mary D. Roberts	120 00	5 19
Albert E. Mundion	63 75	2 75
Mary Dempsey	50 00	2 16
James Dempsey	80 00	3 46
John H. Gay and Catherine Gay	50 00	2 16
George Lasher and Jennie Lasher as administrators of Charles Lasher, deceased	15 00	65
Ann Gormley	25 00	97
Benson Brick Co	800 00	30 90
Rachel M. Sherman	250 00	9 67
Anthony Post	1,800 00	52 96
Margaret E. Greene	90 00	2 65
James H. Swatling	107 25	3 15
Marvin A. Jones	135 00	3 97
Mortimer Smith	125 00	3 68
Henry Baird	140 00	4 12
James S. Burr	140 00	4 12
Frank T. Pearse	25 00	74
John H. Ives	29 00	85
Carried forward	$39.300 25	$2,425 20

	Amount of judgment.	Amount of interest.
Brought forward	$39,300 25	$2,425 20
George Lasher and Jennie Lasher, administrators, etc.	20 00	59
George Lasher	20 00	59
James C. Pearse	35 00	1 03
William H. Smith	30 00	88
Roland Hall	20 00	59
William H. Hayes	133 42	1 78
J. J. Curtin	90 00	1 20
Adell L. Eldridge	133 42	1 78
Ada Johns	120 00	1 60
Frank Sterling	80 00	1 07
John J. Houck and Joseph D. Houck	130 00	1 73
Mary Bargy	55 00	73
William Boudry	120 00	1 60
Charles W. McIntyre	20 00	27
Anna F. Jones	175 00	2 33
Lewis J. Clifton	75 00	1 00
James K. Fuller	80 00	1 07
Charles F. Graham	55 00	73
Rachel E. Houghtaling	15 00	20
Smith Peck	20 00	27
Jacob Stolusky and Joseph Stolusky	90 00	1 20
Smith Peck	20 00	27
	$40,837 09	$2,447 71

Champlain Canal.

	Amount of judgment.	Amount of interest.
William Luckman	$300 00	$21 95
Byron D. Juckett	400 00	26 04
Frank W. Neilson and Bliss Neilson	200.00	13 02
Fred Virgil	108 50	4 68
Willard Allen	53 20	2 29
Sarah E. Brown	483 00	20 88
David B. Bartholomew	332 50	14 37
Carried forward	$1,877 20	$103 23

	Amount of judgment.	Amount of interest.
Brought forward	$1,877 20	$103 23
John M. Butler	455 35	19 67
Walter H. Balch	147 70	6 37
Lute Virgil	491 75	21 26
Frank Johnson	455 00	19 67
Andrew Matthews	267 75	11 55
Jerry Brown and John Harris	350 00	15 13
Jerry Brown and Frank Johnson	154 00	6 65
Maurice A. Yarter	60 00	2 59
Henry Baldwin	205 00	8 87
Thomas Morrow	325 00	14 05
Jennie Hilton	150 00	6 48
Jennie Hilton	100 00	4 32
Catherine Fitzpatrick	475 00	20 53
Julia A. Kinner	580 00	22 40
Maggie Kinner	531 06	20 52
Emma Griffin	100 00	3 86
Ellen Pender	700 00	20 60
Frank Parrish	20 00	27
Hugh Deming	20 00	27
Hugh Deming	20 00	27
Arthur Needham	50 00	67
John M. Pike and Sarah Dewey Shipman	100 00	1 33
Total	$7,634 81	$330 56

Oswego Canal.

	Amount of judgment.	Amount of interest.
Lewis Keith	$250 00	$83
Lewis Keith	250 00	83
Lewis Keith	250 00	83
Lewis Keith	250 00	83
George Keith	250 00	83
George Keith	250 00	83
Carried forward	$1,500 00	$4 98

	Amount of judgment.	Amount of interest.
Brought forward	$1,500 00	$4 98
William Hinsdale	100 80	6 56
Ellen McCann and Maggie Harrigan..	16 94	1 10
Dwight P. Jennings...............	400 00	5 33
Total	$2,017 74	$17 97

Black River Canal.

	Amount of judgment.	Amount of interest.
Charles Stevens	$550 00	$35 80
John Grimer	98 00	1 30
	$648 00	$37 10

Summary of Judgments Paid.

(Chapter 451, Laws of 1909, and Chapter 535, Laws of 1910.)

Erie canal	$40,837 09
Champlain canal	7,634 81
Oswego canal	2,017 74
Black River canal...........................	648 00
	$51,137 64

Summary of Interest on Judgments Paid.

(Chapter 451, Laws of 1909, and Chapter 535, Laws of 1910.)

Erie canal	$2,447 71
Champlain canal	330 56
Oswego canal	17 97
Black River canal...........................	37 10
	$2,833 34

STATEMENT of the Operation of the Sinking Fund for the Canal Debt, under Article 7, Section 1, of the Constitution.

YEAR.	RECEIVED.								
	Loans to supply deficiencies.	Premiums on loans.	Proceeds of taxes.	From tolls.	Interest on deposits and investments and discount on stocks purchased.	Reimbursement of temporary investment in taxes to be levied, and interest thereon.	Sale of stock investments.	Miscellaneous.	Total.
1846	....	....	....	$433,333 33	....	....	....	....	$433,333 33
1847	....	....	....	1,300,000 00	....	....	....	....	1,300,000 00
1848	$825,000 00	$16,858 94	$119,410 30	1,300,000 00	$1,899 71	....	....	....	2,263,168 95
1849	1,739,024 76	....	....	1,300,000 00	7,774 28	....	....	$760 00	3,047,559 04
1850	....	215,610 76	....	1,300,000 00	....	....	....	42,869 93	1,558,480 69
1851	....	....	....	1,300,000 00	....	....	....	....	1,300,000 00
1852	....	....	....	1,300,000 00	3,250 00	....	....	....	1,303.250 00
1853	....	....	....	1,300,000 00	23,335 79	....	....	....	1,323,335 79
1854	....	....	....	1,300,000 00	10,000 00	$657,145 86	....	....	1,967,145 86
1855	....	....	....	1,300.000 00	28,000 00	....	....	....	1,328,000 00
1856	4,000,000 00	....	....	1,700,000 00	14,000 00	....	....	....	5,714,000 00
1857	....	28,427 73	....	1,589,015 60	34,714 11	....	....	1,989 94	1,654,147 38
1858	1,500,000 00	24,300 00	40,500 00	993,325 97	65,674 74	....	$121,938 00	112 65	2,745,851 36
1859	....	....	47,000 00	962,000 67	18,705 32	....	....	....	1,027,705 99
1860	....	....	....	1,669,611 61	36,258 18	835,663 75	....	....	2,541,533 54
1861	1,200,000 00	16,883 50	....	1,700,000 00	14,650 48	....	....	....	2,931,533 98
1862	....	....	....	1,700,000 00	22,942 24	....	....	....	1,722,942 24
1863	....	....	....	1,700,000 00	54,000 00	582,113 76	....	....	2,336,113 76
1864	....	....	....	1,700,000 00	68,227 00	....	....	....	1,768,227 00
1865	....	....	....	1,650,091 86	99,232 25	9,731 68	....	....	1,759,055 79
1866	....	....	....	1,700,000 00	59,992 22	468,000 00	....	....	2,227,992 22
1867	....	....	....	1,700,000 00	75,471 25	624,000 00	....	....	2,399,471 25
1868	....	....	....	1,700,000 00	73,173 43	520,000 00	....	....	2,293,173 43
1869	....	....	....	....	59,513 00	1,034,500 00	....	....	1,094,013 00

1870					53,803 75	36,040 00			89,843 75
1871					14,030 99	525,000 00			539,030 99
1872					13,541 92	290,466 67			304,008 59
1873					25,473 71	488,130 00			513,603 71
1874			195,000 00		10,863 40				205,863 40
Total	$9,264,024 76	$302,080 93	$401,910 30	$32,597,379 04	$888,527 77	$6,070,791 72	$121,938 00	$45,732 52	$49,692,385 04

Statement of the Operation of the Sinking Fund for the Canal Debt, etc.—(Concluded).

YEAR.	PAID.											
	Principal of debt.	Interest on debt.	Claims prior to 1st June, 1846.	Premium on stocks purchased.	Accrued interest on stocks purchased.	Temporary investments in taxes to be collected.	Investments in stocks.	Certificates, plates and agency in New York.	Premium on coin purchased to pay interest.	General fund for deferred contributions, under art. 7, sec. 2 of the Constitution and interest thereon.	Miscellaneous.	Total.
1846....	$433,333 33											$433,333 33
1847....	205,256 00	$937,205 64		$5,131 40				$2,116 00				1,149,709 04
1848....	1,341,489 00	911,736 05		3,829 25	$9 21			2,452 00				2,259,515 51
1849....	2,097,329 00	898,599 05			2,101 38			2,597 00				3,000,626 43
1850....	482,786 64	861,211 00	$84,715 52		1,636 34			2,185 00				1,432,534 50
1851....	573,609 91	822,435 38	34,829 53		177 05			2,257 50				1,433,309 37
1852....	340,265 45	801,161 00			278 53			2,170 75				1,143,875 73
1853....		801,161 00				$621,467 47		2,087 50				1,424,715 97
1854....	479,025 00	792,911 00	10,936 86					2,229 66				1,285,102 52
1855....	1,111,911 00	750,669 07	25,177 03					2,411 05				1,890,168 15
1856....	4,118,266 34	692,193 28	12,113 37					3,908 13				4,825,481 12
1857....	102,285 00	692,193 28	32,377 93		267 95		$72,938 00	2,391 63				902,453 79
1858....	2,929,767 34	672,710 72	217 39		82 22		49,000 00	2,001 38			$338 35	3,655,117 40
1859....	152,170 00	614,263 04	180 00			600,000 00		2,358 00			4,156 28	1,373,127 32
1860....	900,523 00	600,116 50	318 00			200,000 00		2,381 25				1,703,338 75
1861....	2,175,551 23	538,675 36						2,412 00			156 31	2,716,794 90
1862....	920,000 00	517,230 08	220 00	22 49		559,724 77		2,212 00				1,999,409 34
1863....	431,300 00	487,366 48	11 01	36,304 75	3,212 08			2,184 00	$80,715 93		406 77	1,041,501 02
1864....	457,700 00	457,105 98	50 00	8,391 25	363 60	9,268 27		2,307 25	31,418 47			966,604 82
1865....	2,644,374 76	325,462 61		8,308 50	1,617 42	450,000 00		2,191 50		$600,000 00		4,031,954 79
1866....	415,750 00	251,565 00			576 92	600,000 00		2,239 00		782,961 04		2,053,091 96
1867....	1,662,000 00	209,427 50		500 00	7,668 61	510,000 00		2,233 00		363,125 00	140 00	2,755,094 11
1868....	1,017,200 00	138,378 75		1,856 46	3,423 35	1,000,000 00		2,249 50				2,163,108 06
1869....	1,111,280 00	90,460 25		6,028 75	529 56	34,000 00		2,108 00				1,244,406 56
1870....	23,000 00	55,896 00		300 00		500,000 00		2,163 50	5,186 94			586,546 44
1871....		55,321 00						2,274 19	6,801 66			64,396 85
1872....		55,321 00				737,500 00		1,454 18	6,382 00			800,757 18
1873....		55,321 00						750 00	8,035 39			64,106 39
1874....	1,098,250 00	13,830 25						3,707 50	115,898 18			1,231,685 93

1875....	2,170 00	....	....	....	....	....	....	....	....	....	....	2,170 00
1876....	....	....	....	....	....	....	....	....	....	....	....	....
1877....	....	....	....	....	....	....	....	....	....	....	*52,187 76	52,187 76
1878....	....	....	....	....	....	....	....	....	....	....	....	....
1879....	....	....	....	....	....	....	....	....	....	....	....	....
1880....	....	....	....	....	....	....	....	....	....	....	....	....
1881....	....	....	....	....	....	....	....	....	....	....	....	....
1882....	....	....	....	....	....	....	....	....	....	....	....	....
1883....	....	....	....	....	....	....	....	....	....	....	....	....
1884....	6,000 00	....	....	....	....	....	....	....	....	....	....	6,000 00
Total...	$27,232,593 00	$14,099,927 27	$201,146 64	$70,672 85	$21,944 22	$5,821,960 51	$121,938 00	$64,132 47	$254,438 57	$1,746,086 04	$57,385 47	$49,692,225 04
	Balance on hand 30th September, 1910											160 00
												$49,692,385 04

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*This amount being a surplus, is transferable to Sinking Fund, under article 7, section 3, in pursuance of act, chapter 150 of the Laws of 1878.

STATEMENT of the Operation of the Sinking Fund for the Canal Debt, under Article 7, Section 3, of the Constitution.

YEAR.	RECEIVED.						
	Loans to supply deficiencies.	Premiums on loans.	Proceeds of taxes.	From tolls.	Interest on deposits and investments and discount on stock purchased.	Miscellaneous.	Total.
1854				$94,861 72			$94,861 72
1855					$3,809 00		3,809 00
1856	$500,000 00		$232,500 00		8,426 92		740,926 92
1857	500,000 00	$10,450 47			4,420 32	$310 92	515,181 71
1858	500,000 00	31,025 50			4,408 84		535,434 34
1859			680,000 00		4,629 29		684,629 29
1860	1,200,000 00	15,178 50			4,860 75		1,220,039 25
1861				645,842 16	5,103 79		650,945 95
1862			1,580,742 61	1,146,242 66		41,086 77	2,768,072 04
1863			198,534 00	1,116,242 66	37,178 76		1,351,955 42
1864				1,116,242 66	40,998 54		1,157,241 20
1865					40,443 25		40,443 25
1866			690,000 00	824,756 39	32,766 75		1,547,523 14
1867				780,165 14	71,381 28		851,546 42
1868				1,116,242 66	30,449 84		1,146,692 50
1869				1,382,772 58	35,805 44		1,418,578 02
1870					46,550 22		46,550 22
1871							
1872	1,562,900 00	9,789 86	913,866 65				2,486,556 51
1873	3,145,500 00			123,286 80		183,686 61	3,452,473 41
1874	2,004,600 00		575,339 69	1,278,506 08		54,825 42	3,913,271 19
1875	2,000,000 00	60,000 00		458,679 68	22,285 04		2,540,964 72
1876	473,000 00	27,601 50	*655,538 69	338,138 28	11,818 97		1,506,097 44
1877				3,031 33	46,761 90		49,793 23
1878			900,208 50	248,902 38	59,466 63	†143,733 34	1,352,310 85
1879			805,083 31	169,477 99	43,220 00	2,070 00	1,019,851 30
1880			789,724 90	311,118 79	50,435 00		1,151,278 69
1881			878,938 03		80,773 66	13,034 96	972,746 65
882			758,797 92		78,887 88	3,695 20	841,381 00

1883			1,115,648 46		78,955 93	12,235 40	1,206,839 79
1884			1,988,508 34		90,144 45		2,078,652 79
1885			950,310 00		137,490 76	55,781 25	1,143,582 01
1886			850,310 00		148,985 78	22,875 00	1,022,170 78
1887			850,310 00		179,240 26	182,137 50	1,211,687 76
1888			754,457 00		121,820 53	132,356 77	1,008,634 30
1889			725,255 00		129,542 07	2,500 00	857,297 07
1890			615,000 00		138,416 01	84,673 40	838,089 41
1891			718,520 00		99,096 62	130,691 20	948,307 82
1892			605,581 40		54,885 44	11,000 00	671,466 84
1893			32,540 00		7,564 33	804 00	40,908 33
1894					2,575 25		2,575 25
1895					530 72		530 72
1896						40,000 00	40,000 00
Total	$11,886,000 00	$154,015 83	$18,865,714 50	$11,154,509 96	$1,954,130 22	$1,117,497 74	$45,131,898 25

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* Transferred from the fund for extraordinary repairs, pursuant to section 7 of chapter 425 of the Laws of 1876. The money was originally appropriated from the proceeds of taxes for extraordinary repairs.

† Transferred from Sinking Fund under article 7, sections 1 and 12 of the Constitution, pursuant to chapter 150 of the Laws of 1878, being the surpluses of those funds.

Statement of the Operation of the Sinking Fund for the Canal Debt, etc.—(Concluded).

YEAR.	PAID.							
	Principal of debt.	Interest on debt.	Premiums on stocks purchased.	Accrued interest on stocks purchased.	Interest on temporary advances.	Premium on coin purchased to pay interest.	Miscellaneous.	Total.
1854	....	$18,691 23	....	....	....	....	....	$18,691 23
1855	....	211,274 82	....	....	....	....	....	211,274 82
1856	....	417,484 11	....	....	....	....	....	477,484 11
1857	....	644,914 37	....	....	....	....	....	644,914 37
1858	....	706,280 80	....	....	....	....	....	706,280 80
1859	....	710,000 00	....	....	....	....	....	710,000 00
1860	....	728,000 00	....	....	$40,614 02	....	$431 29	769,045 31
1861	....	782,000 00	$498 13	$745 35	....	....	132 53	783,376 01
1862	$1,200 000 00	728,000 00	....	....	....	....	....	1,928,000 00
1863	60,000 00	710,000 00	6,982 50	288 75	....	$117,593 75	....	894,865 00
1864	204,000 00	704,450 00	22,737 50	....	1,038 50	....	10,737 55	942,961 55
1865	69,000 00	694,212 50	8,990 00	188 47	....	....	....	772,390 97
1866	100,000 00	690,850 00	....	249 42	....	....	....	791,099 42
1867	792,000 00	657,975 00	....	3,211 44	....	....	....	1,453,186 44
1868	450,900 00	630,057 50	2,254 50	....	....	....	....	1,083,212 00
1869	502,900 00	611,715 00	15,010 30	53 17	....	....	....	1,129,678 47
1870	536,200 00	573,186 00	29,551 00	....	....	51,296 67	....	1,190,233 67
1871	....	557,100 00	....	....	....	67,402 87	....	624,502 87
1872	1,481,800 00	533,656 50	....	....	....	60,195 56	2,739 99	2,078,392 05
1873	3,145,300 00	502,393 50	....	....	....	62,888 24	227,309 23	3,937,887 97
1874	2,028,800 00	527,188 84	....	....	....	40,404 96	106,631 17	2,703,024 97
1875	2,141,600 00	551,260 39	....	....	....	83,029 99	7,570 85	2,783,461 23
1876	478,000 00	551,160 00	....	....	....	65,928 20	3,150 47	1,098,238 67
1877	181,300 00	546,036 89	25,845 00	....	....	31,173 95	2,125 75	786,481 59
1878	....	540,822 00	....	....	....	8,109 54	2,114 50	551,046 04
1879	32,000 00	540,822 00	5,622 50	....	....	....	2,106 50	580,551 00
1880	....	538,902 00	10,450 00	....	....	....	2,075 00	551,427 00
1881	5,000 00	538,602 00	55,581 25	....	....	....	2,062 00	601,245 25
1882	....	538,602 00	....	....	....	....	2,062 00	540,064 00
1883	635,200 00	519,336 00	278,303 13	71 67	....	....	2,074 50	1,434,985 30
1884	3,000 00	500,310 00	....	....	....	....	2,059 00	505,369 00
1885	....	500,310 00	40,856 25	....	....	....	2,064 00	543,230 25
1886	34,650 00	500,250 00	95,870 38	1,418 69	....	....	2,096 50	634,285 57
1887	1,660,200 00	495,840 00	39,690 60	3,729 14	....	....	2,113 00	2,201,572 74

1888	501,650 00	372,997 50	107,243 85	9,590 90	....	....	2,051 50	993,533 75
1889	90,500 00	366,045 00	6,957 50	1,407 12	....	....	2,051 50	466,961 12
1890	1,710,550 00	325,402 50	80,386 28	22,603 48	....	....	2,051 00	2,140,992 26
1891	1,936,650 00	243,855 00	9,197 12	7,219 20	....	....	2,078 00	2,198,999 32
1892	1,941,800 00	76,722 00	51,147 34	19,388 79	....	....	2,032 50	2,091,090 63
1893	462,500 00	9,000 00	470 58	....	....	....	2,073 25	474,043 83
1894	....	....	....	....	....	....	1,250 00	1,250 00
1895	....	....	....	....	....	....	41,250 00	41,250 00
1896	....	....	....	....	....	....	*60,217 67	60,217 67
Total	$22,385,500 00	$20,655,705 45	$893,645 71	$71,203 09	$40,614 02	$598,759 28	$485,970 70	$45,131,398 25
Balance on hand 30th September, 1910								500 00
								$45,131,898 25

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* Surplus transferred to Sinking Fund, section 4, as authorized by chapter 700, Laws 1896.

STATEMENT Showing the Amount of Taxes Paid into the Treasury, for Account of the Canal Fund, under the Present Constitution.

Y'R.	For General Fund, Debt Sinking Fund and for other purposes.	For Sinking Fund under article 7, section 1.	For Sinking Fund, under article 7, section 3.	For Sinking Fund, under article 7, section 12.	For Sinking Fund, under article 7, section 4.	For enlargement and completion of the canals, under article 7, section 3, and for extraordinary repairs.	For improvement of the Champlain canal	For extension of the Chenango canal.	For improvement of the Genesee Valley canal.	For maintenance and ordinary repairs.	Total.
1846...	$56,503 47	...	...	...	...	...	...	...	...	...	$56,503 47
1847...	...	$119,410 30	...	...	...	...	...	...	...	...	119,410 30
1851...	$621,467 47	...	...	...	...	...	...	...	...	...	621,467 47
1856...	87,500 00	...	$232,500 00	...	...	...	...	...	...	...	320,000 00
1857...	262,500 00	...	...	...	...	...	...	...	...	...	262,500 00
1858...	...	40,500 00	...	...	...	$1,200,000 00	...	...	...	...	1,240,500 00
1859...	...	47,000 00	680,000 00	...	...	163,567 66	...	...	...	...	890,567 66
1860...	...	...	...	...	...	1,069,515 70	...	...	...	...	1,069,515 70
1861...	...	...	...	$330,000 00	...	490,552 28	...	...	...	...	840,552 28
1862...	...	...	1,580,742 61	475,205 60	...	713,674 88	...	...	...	...	2,769,623 09
1863...	...	...	198,534 00	355,040 28	...	866,614 17	...	...	...	...	1,420,188 45
1864...	...	...	...	535,373 94	...	...	...	...	...	...	535,373 94
1865...	...	...	...	367,744 97	...	...	$147,097 99	$275,000 00	$91,936 24	...	881,779 20
1866...	...	...	690,000 00	379,965 52	...	639,879 33	151,936 21	285,782 86	...	...	2,147,613 92
1867...	...	...	...	187,575 63	...	656,246 00	281,363 15	281,363 15	...	...	1,406,547 93
1868...	...	...	...	203,853 20	...	815,412 78	...	...	...	...	1,019,265 98
1869...	...	*346,153 47	...	184,171 40	...	678,575 52	95,700 00	281,800 00	242,000 00	...	1,828,400 39
1870...	...	...	...	227,864 79	...	1,087,188 77	80,000 00	200,000 00	...	...	1,595,053 56
1871...	...	†24,713 61	...	240,957 65	...	3,274,364 67	140,000 00	200,000 00	...	...	3,880,035 93
1872..	...	*25,000 00	913,866 65	251,435 90	...	470,495 71	†402,297 43	175,000 00	...	...	2,238,095 69
1873...	...	*50,000 00	...	230,271 15	...	2,194,843 06	69,544 75	101,158 66	...	...	2,645,817 64
1874...	...	‡220,000 00	575,339 69	260,879 28	...	2,441,018 16	...	...	...	...	3,497,237 08
1875...	...	...	...	212,592 17	...	1,825,226 87	†500,000 00	...	...	...	2,537,819 04
1876...	...	...	...	290,053 06	...	422,766 99	...	...	...	...	712,819 96
1877...	...	...	...	...	...	...	...	...	...	...	...
1878...	...	...	900,208 50	...	...	...	...	...	...	...	900,206 50
1879...	...	...	805,083 31	...	...	...	...	...	...	...	805,083 31
1880...	...	...	789,724 90	...	...	...	...	...	...	...	789,724 90
1881...	...	...	878,938 03	...	...	...	...	...	...	...	878,938 03
1882...	...	...	758,797 92	...	...	...	...	...	...	...	758,797 92
1883...	...	...	1,115,648 46	...	...	...	...	...	...	$260 30	1,115,917 76

1884...	....	....	1,988,508 34	....	....	82,360 96	....	....	....	829,675 00	2,900,544 32
1885...	....	....	950,310 00	....	....	115,301 41	....	....	....	652,800 00	1,718,411 41
1886...	....	....	850,310 00	....	....	62,313 17	....	....	....	770,750 00	1,683,373 17
1887...	....	....	850,310 00	....	....	465,700 00	....	....	....	781,450 00	2,097,460 00
1888...	....	....	754,457 00	....	....	802,592 37	....	....	....	791,200 00	2,348,249 37
1889...	....	....	727,255 00	....	....	709,812 00	....	....	....	808,500 00	2,243,597 00
1890...	....	....	615,000 00	....	....	852,000 00	....	....	....	660,000 00	2,127,000 00
1891...	....	....	718,520 00	....	....	470,088 66	....	....	....	983,500 00	2,172,108 66
1892...	....	....	605,581 40	....	....	266,531 80	....	....	....	856,500 00	1,728,613 20
1893...	....	....	32,540 00	....	....	244,694 94	....	....	....	885,500 00	1,162,734 94
1894...	....	....	....	....	....	485,000 00	....	....	....	615,000 00	1,100,000 00
1895...	....	....	....	....	....	524,549 63	....	....	....	466,032 53	990,582 16
1896...	....	....	....	....	....	822,382 06	....	....	....	1,273,176 88	2,095,559 54
1897...	....	....	....	....	556,574 03	760,199 29	....	....	....	1,254,396 15	2,571,169 47
1898...	....	....	....	....	574,189 98	618,358 44	....	....	....	927,537 66	2,120,086 08
1899...	....	....	....	....	450,000 00	400,000 00	....	....	....	750,000 00	1,600,000 00
1900...	....	....	....	....	846,751 02	697,250 86	....	....	....	1,094,487 52	2,638,489 40
1901...	....	....	....	....	709,969 36	983,034 49	....	....	....	1,146,873 58	2,839,877 43
1902...	....	....	....	....	739,299 82	853,038 25	....	....	....	966,776 68	2,559,114 75
1903...	....	....	....	....	748,072 05	....	....	....	....	....	748,072 05
1904...	....	....	....	....	761,085 02	....	....	....	....	....	761,085 02
1905...	....	....	....	....	968,041 90	....	....	....	....	....	968,041 90
1906...	....	....	....	....	1,191,677 51	....	....	....	....	....	1,191,677 51
1907...	....	....	....	....	5,089,582 61	....	....	....	....	....	5,089,582 61
1908...	....	....	....	....	5,439,015 92	....	....	....	....	....	5,439,015 92
1909...	....	....	....	....	5,825,214 55	....	....	....	....	....	5,825,214 55
1910...	....	....	....	....	1,043,910 82	....	....	....	....	....	1,043,910 82
Total..	$1,027,970 94	$872,777 38	$18,210,175 81	$4,752,984 49	$24,913,414 60	$29,225,181 41	$1,867,989 53	$1,800,104 69	$333,936 24	$16,514,425 30	$99,548,960 89

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* Reconstructing Oneida Lake canal. † Enlargement of Champlain canal. ‡ $25,000 reconstructing Oneida Lake canal. § For damages prior to June 1, 1846, and sundry objects and works.

STATEMENT of Receipts and Payments on Account of the Oswego Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEARS.	Loans.	Premiums on loans.	RECEIVED.						
			Avails of loans.	Erie and Champlain tolls.	Tolls.	Sales of land.	Rent of surplus water.	Miscellaneous.	Total.
1826	$227,000 00		$227,000 00			$29,698 82			$256,698 82
1827						2,124 19			2,124 19
1828	210,000 00	$2,805 00	212,805 00		$2,057 82	79,648 59			294,611 41
1829					9,071 93	34,257 86	$723 70		44,053 49
1830					12,430 01	33,508 76	825 00		46,783 77
1831*					11,465 20	11,870 75	1,571 83	$3,992 67	28,900 45
1832					16,610 65	47 58	325 00		16,983 23
1833					22,965 26	221 81	325 00		23,512 07
1834					22,174 13	749 39	325 00		23,248 52
1835					26,267 09	456 42	325 00		27,048 51
1836					29,359 93	6,539 80	325 00	151 08	36,375 81
1837					24,556 97	8,898 00	325 00		33,779 97
1838					22,961 40	475 00	325 00		23,761 40
1839					32,593 80	4,360 00	325 00		37,278 80
1840					29,166 71		325 00		29,491 71
1841					34,630 03		325 00		34,965 03
1842					35,878 82	131 00			36,009 82
1843					31,914 21				31,914 21
1844					50,013 24				50,013 24
1845					53,831 17				53,831 17
1846				$421,304 00	60,101 35				481,405 35
1847				100,000 00	70,839 01				170,839 01
1848					71,564 58			6,000 00	77,564 58
1849					86,139 66			6,000 00	92,139 06
1850					94,524 17			5,448 97	99,973 14
1851					104,366 58				104,366 58
1852	200,000 00	18,885 00	218,885 00		82,951 22			10,764 62	312,600 84
1853					88,830 97			65,841 57	154,081 54
1854					81,266 00			172,966 68	254,232 68
1855					64,954 15			197,187 18	262,141 33
1856					96,136 22			261,982 70	358,118 92
1857					105,141 39			293,120 04	398,261 43
1858					83,939 46			390,581 08	474,520 54
1859					60,348 37			136,544 62	205,892 99
1860					109,840 03			352,522 14	462,362 17
1861					131,458 38			116,820 00	248,278 47
1862					153,006 82			172,019 04	325,025 86
1863					143,273 75	500 00		31,722 05	175,495 89
1864					142,561 87	277 50		35,961 63	178,801 00

1865					112,063 86	549 95		95,931 17	208,544 98
1866					143,364 27	49 95		285,933 38	429,347 60
1867					154,382 77	609 20		6,081 79	161,073 76
1868					173,027 99			130,195 33	303,223 32
1869					156,593 02			34,682 20	191,255 22
1870					138,648 54			233,679 75	372,328 29
1871					109,899 44			113,856 83	223,756 27
1872					90,796 57	1,040 38		141,673 94	233,510 89
1873					88,428 13			89,201 17	177,629 30
1874					70,119 59			156,605 58	226,725 17
1875					45,057 69			14,413 34	59,471 03
1876					29,007 51			35,758 72	64,766 23
1877					20,098 00			15,820 45	35,918 45
1878					12,708 56			15,148 53	27,857 09
1879					9,377 11				9,377 11
1880					14,388 45				14,388 45
1881					13,650 59			94 57	13,745 16
1882					14,696 35			1 38	14,698 23
1883					7,016 61			2 30	7,018 91
1884								35,492 65	35,492 65
1885								34,888 75	34,888 75
1886								38,538 90	38,538 90
1887								90,223 60	90,223 60
1888								94,031 87	94,031 87
1889								106,881 78	106,881 78
1890								114,184 37	114,184 37
1891								108,415 04	108,415 04
1892								61,271 87	61,271 87
1893								62,308 00	62,308 00
1894								67,382 27	67,382 27
1895								110,751 15	110,751 15
1896								87,711 47	87,711 47
1897								296,045 56	296,045 56
1898								317,393 76	317,393 76
1899								56,113 69	56,113 69
1900								83,976 30	83,976 30
1901								65,432 93	65,432 93
1902								63,125 15	63,125 15
1903								57,412 63	57,412 63
1904								105,495 49	105,495 49
1905								123,219 85	123,219 85
1906								144,084 85	144,084 85
1907								131,301 18	131,301 18
1908								259,860 21	259,860 21
1909								402,235 69	402,235 69
1910								559,405 87	559,405 87
Total	$637,000 00	$21,690 00	$658,690 00	$521,304 00	$3,711,526 40	$216,114 95	$6,370 53	$7,305,872 06	$12,419,877 94
Deficiencies paid by General Fund and Erie and Champlain canals									1,267,707 55
									$13,687,585 49

* Nine months.

OSWEGO CANAL.

YEARS.	DEFICIENCIES.		PAID.							
	Paid by the General Fund.	Paid by the Erie and Champlain canal.	Principal of loans.	Surplus tolls Erie and Champlain canals.	Interest on loans.	Canal Commissioners and Superintendent of Public Works.	Superintendents of repairs.	Expenses of collectors and inspectors.	Miscellaneous.	Total.
1826	...	...	...	...	$5,083 81	$237,015 57	...	...	...	$242,099 38
1827	...	...	...	...	11,350 00	175,221 00	...	...	...	186,571 00
1828	...	...	...	...	18,917 35	83,774 46	$8,418 00	...	$500 00	111,609 81
1829	...	...	...	...	21,850 00	43,319 99	13,186 40	$942 04	400 04	79,699 47
1830	$16,062 18	...	...	...	21,850 00	3,310 00	12,972 51	1,837 25	364 54	40,334 30
1831*	13,683 53	...	$9,653 00	...	16,146 18	...	8,860 48	1,866 77	6,057 55	42,583 93
1832	17,892 61	...	...	...	21,967 36	...	12,507 99	1,974 39	1,657 88	37,507 62
1833	13,738 82	...	...	...	21,367 36	...	11,236 72	2,015 03	...	34,619 11
1834	12,649 83	...	...	...	21,367 36	...	12,522 48	2,008 51	...	35,898 35
1835	9,028 24	...	...	...	21,216 28	...	12,747 26	2,044 97	67 24	36,075 75
1836	43,942 97	...	6,043 00	...	21,065 20	...	51,061 14	2,147 44	...	80,319 78
1837	44,857 31	...	...	...	21,065 20	165 00	54,625 00	2,616 81	165 27	78,637 28
1838	54,460 70	...	...	...	21,065 20	1,156 21	53,997 56	2,203 13	...	78,222 10
1839	11,497 62	...	...	...	21,065 20	...	24,624 60	3,086 62	...	48,776 42
1840	30,760 33	...	...	...	21,065 20	...	36,198 40	2,988 44	...	60,252 04
1841	...	$15,345 08	...	...	21,065 20	...	26,241 95	2,922 96	...	50,000 11
1842	...	18,383 59	...	...	21,065 20	...	30,189 57	3,138 64	...	54,393 41
1843	...	14,659 45	...	...	21,065 20	...	22,741 60	2,766 86	...	46,573 66
1844	...	7,767 60	...	...	21,065 20	...	27,410 68	2,774 31	6,530 65	57,780 84
1845	...	16,889 06	...	...	21,065 20	...	46,531 82	3,123 21	...	70,720 23
1846	...	13,506 25	387,248 45	...	16,041 54	...	54,273 11	3,263 75	29 20	460,856 05
1847	...	...	31,055 55	$27,370 85	...	...	39,439 41	3,228 30	800 45	104,894 56
1848	...	6,231 10	...	...	...	...	74,093 10	3,690 67	12 00	77,795 77
1849	...	...	...	46,873 70	...	4,939 70	33,470 43	3,855 83	...	86,139 66
1850	...	21,188 32	...	...	...	82,507 60	29,631 44	3,598 45	...	115,737 49
1851	...	...	...	4,907 20	...	60,546 29	30,913 20	4,775 91	3,223 98	104,366 58
1852	...	27,161 52	...	...	8,186 30	75,652 45	40,972 84	4,468 08	2,538 95	131,818 62
1853	...	104,050 57	...	...	12,000 00	166,726 53	39,322 17	4,748 09	230,078 45	422,875 24
1854	...	100,000 00	...	...	12,000 00	308,087 93	67,247 64	5,734 16	101 00	393,170 73
1855	...	85,282 52	...	...	12,000 00	327,307 14	64,635 15	5,718 23	1,503 54	411,154 08
1856	...	...	...	30,536 21	12,000 00	257,828 62	50,529 15	6,010 83	710 40	366,675 24
1857	...	...	...	15,641 95	12,000 00	214,921 60	83,267 97	6,231 47	66,198 44	393,261 43
1858	...	20,207 07	...	...	12,000 00	181,564 60	97,565 51	6,668 65	42,646 48	340,445 24
1859	...	...	...	7,139 69	12,000 00	161,053 67	44,427 25	5,114 67	18,664 87	248,400 15
1860	...	...	...	60,547 16	12,000 00	421,088 67	5,264 93	7,585 87	14,561 35	521,047 68
1861	...	...	...	98,040 83	12,000 00	140,281 93	3,776 53	5,653 25	23,192 76	282,958 30

1862				86,529 41	12,000 00	30,960 51	0,535 49	5,229 85	33,736 44	278,991 10
1863				95,939 32	12,000 00	65,293 12	1,899 18	5,080 09	43,122 91	223,334 62
1864				102,785 07	12,000 00	36,703 92	5,761 16	5,915 10	31,184 41	194,379 66
1865		194,017 75			12,000 00	136,265 89	209,759 45	6,695 61	36,893 51	401,614 46
1866		19,198 11			9,180 00	175,256 74	9,956 19	7,199 76	44,527 53	446,120 22
1867		10,174 96	200,000 00			116,998 54	6,230 02	7,273 17	40,746 99	171,248 72
1868				62,581 68		142,467 31	125 00	7,129 64	99,969 69	303,223 32
1869				33,035 87		107,408 08	1,857 34	7,245 75	41,708 18	191,255 22
1870				76,603 21		231,584 45	1,904 38	8,788 83	53,447 42	372,328 29
1871				39,069 30		121,035 80	4,289 93	8,114 07	51,247 17	223,756 27
1872		79,957 87				206,450 48	26,704 91	7,908 84	72,404 50	313,468 76
1873		5,230 85				107,267 83	40,268 33	7,631 80	27,692 19	182,860 15
1874		44,397 35				152,460 39	04,198 77	7,718 30	6,745 06	271,122 52
1875		59,372 01				15,652 25	94,234 04	7,494 35	1,462 40	118,843 04
1876		27,175 17				35,327 18	42,645 08	6,807 36	6,161 78	91,941 40
1877		25,075 84				4,086 83	51,200 31	4,381 58	1,325 57	60,994 29
1878		20,757 49				12,459 04	26,756 31	3,574 92	5,827 31	48,041 58
1879		19,741 34				8,378 71	18,213 28	2,526 46		29,118 45
1880		23,488 55				12,410 26	22,885 36	2,581 38		37,877 60
1881		29,868 69				15,962 01	24,746 48	2,905 27		43,013 76
1882		17,174 27				5,559 64	23,447 20	2,865 66		31,872 50
1883		22,831 03				6,504 56	21,209 75	2,135 60	4,399 91	31,219 82
1884						10,481 64	22,845 33	2,165 68		35,492 65
1885						9,564 96	22,904 52	2,397 34	21 93	34,888 75
1886						13,284 53	22,936 82	2,285 56	31 99	38,538 90
1887						57,449 96	22,753 69	2,019 95	8,000 00	90,223 60
1888						62,100 82	21,365 25	2,047 66	8,518 14	94,031 87
1889						73,579 44	26,162 18	2,445 86	5,694 30	106,881 78
1890						77,649 17	29,535 56	2,401 62	4,598 02	114,184 37
1891						74,914 64	25,347 63	2,227 25	5,925 52	108,415 04
1892						33,884 69	24,572 18	2,262 72	552 28	61,271 87
1893						35,509 27	23,064 91	2,244 43	1,489 28	62,308 09
1894						40,266 73	22,559 68	2,255 29	2,300 66	67,382 27
1895						80,793 92	23,761 05	1,157 86	5,038 32	110,751 15
1896						46,105 64	22,825 45	1,025 71	17,754 67	87,711 47
1897						254,330 24	22,705 37	2,185 35	16,824 60	296,045 56
1898						279,295 13	21,051 75	1,983 32	15,063 56	317,393 76
1899						32,042 39	22,200 89	1,702 78	158 63	56,113 69
1900						38,129 18	30,904 29	1,762 46	13,090 37	83,976 30
1901						25,402 82	29,725 31	1,127 81	9,176 96	65,432 93
1902						28,152 61	28,561 17	734 69	5,706 68	63,125 15
1903						18,623 83	30,474 07	711 35	7,693 38	57,412 63
1904						30,320 67	28,710 64	703 17	45,761 01	105,495 49
1905						47,407 71	30,248 09	694 72	44,869 33	123,219 85
1906						42,611 99	10,716 56	700 62	99,055 77	144,084 85
1907						31,197 77	2,125 00	663 36	97,315 05	131,301 18
1908						32,375 68	1,500 00	635 45	225,349 08	259,869 21
1909						43,872 25	1,500 00	400 00	355,458 45	402,235 60
1910						18,779 64	1,500 00	600 00	538,526 23	559,405 87
Total	$268,574 14	$999,133 41	$637,000 00	$784,611 45	$580,575 54	$6,330,036 84	$2,555,561 40	$289,457 83	$2,509,412 37	$13,637,585 49

* Nine months.

STATEMENT of Receipts and Payments on Account of the Cayuga and Seneca Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	Loans.	Premiums on loans.	RECEIVED.						DEFICIENCIES.	
			Avails of loans.	From other funds to redeem stock.	From Sinking Fund to pay interest.	Tolls.	Miscellaneous.	Total.	Paid by the General Fund.	Paid by Erie and Champlain canals.
1826	$150,000 00	$9,000 00	$159,000 00			$2,820 75		$161,820 75		
1827						155 19		155 19		
1828										
1829	87,000 00		87,000 00			8,370 24		95,370 24		
1830						13,087 51		13,087 51	$22,006 11	
1831*						8,859 48		8,859 48	7,757 21	
1832						12,375 77		12,375 77	5,284 93	
1833						15,591 50		15,591 50	5,826 44	
1834						18,053 14		18,053 14	3,761 70	
1835						20,192 61		20,192 61	3,352 51	
1836						19,914 53	$47 50	19,962 03	19,662 76	
1837						16,648 77		16,648 77	27,177 52	
1838						17,488 82		17,488 82	15,517 62	
1839						19,354 67		19,354 67	17,890 68	
1840						17,787 29		17,787 29	18,259 96	
1841						22,445 46		22,445 46		$9,299 84
1842						17,992 67		17,992 67		20,909 42
1843						17,938 40		17,938 40		6,319 24
1844						23,054 19		23,054 19		4,265 11
1845						28,881 48		28,881 48		
1846				$143,470 05		29,395 23		172,865 28		
1847					$4,350 00	26,908 78		31,258 78		
1848					4,350 00	28,470 86		32,820 86		
1849				71,886 00	3,262 50	27,735 44		102,883 94		37,502 70
1850				15,114 00		27,589 59	18,328 18	61,031 77		36,258 09
1851						26,258 40	7,038 48	33,296 88		
1852						22,524 38		22,524 38		8,499 33
1853						25,169 84	21,550 00	46,719 84		2,651 01
1854						24,808 90	100,553 00	125,361 90		
1855						21,915 81	102,000 00	123,915 81		
1856						20,919 78	131,728 46	152,648 24		
1857						19,457 35	166,585 09	186,042 44		
1858						14,400 67	191,239 37	205,640 04		19,582 16
1959						17,449 54	45,271 29	62,720 83		
1860						20,089 09	140,044 72	160,133 81		
1861						18,778 32	72,411 21	91,189 53		3,578 69
1862						21,395 82	144,473 71	165,869 53		
1863						25,243 93	30,146 89	55,390 82		
1864						28,040 29	38,372 34	66,412 63		
1865						23,802 22	70,791 20	94,593 42		2,966 05

1866						34,151 25	29,811 35	63,962 60		
1867						29,723 27	4,264 98	33,988 25		
1868						31,656 11	13,814 24	45,470 35		
1869						36,169 41	11,036 39	47,205 80		
1870						28,988 78	102,995 63	131,984 41		9,178 40
1871						22,261 09	24,280 04	46,541 73		27,028 74
1872						17,882 58	26,531 32	44,413 90		20,172 33
1873						22,492 32	6,921 06	29,413 38		4,651 16
1874						19,311 47	34,346 24	53,657 71		11,943 87
1875						13,616 07	25,982 40	39,598 47		16,538 96
1876						11,083 99	675 13	11,759 12		14,312 34
1877						6,580 35	52 45	6,632 80		12,675 17
1878						3,210 20	24,947 60	28,157 80		11,375 61
1879						1,998 21		1,998 21		9,504 90
1880						1,462 57		1,462 57		10,290 88
1881						1,095 27		1,095 27		13,867 99
1882						1,108 59	4,288 37	5,396 96		10,088 31
1883						641 21	18 06	659 27		10,736 70
1884							12,085 70	12,085 70		
1885							15,908 50	15,908 50		
1886							11,511 29	11,511 29		
1887							17,687 92	17,687 92		
1888							17,320 23	17,320 23		
1889							32,613 11	32,613 11		
1890							34,611 37	34,611 37		
1891							18,584 43	18,584 43		
1892							10,974 06	10,974 06		
1893							11,718 16	11,718 16		
1894							10,965 92	10,965 92		
1895							52,324 85	52,324 85		
1896							72,483 95	72,483 95		
1897							43,621 12	43,621 12		
1898							42,074 77	42,074 77		
1899							22,806 99	22,806 99		
1900							31,620 68	31,620 68		
1901							101,707 46	101,707 46		
1902							59,541 92	59,541 92		
1903							42,019 34	42,019 34		
1904							46,409 64	46,409 64		
1905							32,748 33	32,748 33		
1906							37,929 89	37,929 89		
1907							40,162 47	40,162 47		
1908							37,313 35	37,313 35		
1909							39,880 30	39,880 30		
1910							69,682 40	69,682 40		
Total	$237,000 00	$9,000 00	$246,000 00	$230,470 05	$11,962 50	$1,054,800 15	$2,556,864 87	$4,110,097 57	$146,497 44	$334,197 00
Deficiencies paid by General Fund and Erie and Champlain canals								480,694 44		
								$4,590,792 01		

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* Nine months.

Cayuga and Seneca Canal.

Year.	Paid.								
	Principal of loans.	Interest on loans.	Surplus tolls to Erie and Champlain canals.	Canal Commissioners and Superintendent of Public Works.	Seneca Lock Navigation Company.	Superintendents of repairs.	Collectors.	Miscellaneous.	Total.
1826	....	$3,873 28	....	$8,094 47	$34,095 83	....	$255 83	....	$46,319 41
1827	....	7,500 00	....	45,292 70	19,776 05	....	....	$145 23	72,713 98
1828	....	7,500 00	....	90,918 54	....	....	....	8,481 87	106,900 41
1829	....	9,956 55	....	20,783 50	....	$8,038 94	....	2,231 00	41,109 99
1830	....	11,850 00	....	6,885 55	....	5,833 96	826 50	....	25,396 01
1831*	....	8,887 50	....	....	....	3,301 39	822 00	3,605 80	16,616 69
1832	....	11,850 00	....	100 00	....	4,132 85	799 17	200 00	17,082 02
1833	....	11,850 00	....	....	....	9,338 71	807 91	....	21,996 62
1834	....	11,850 00	....	90 00	....	8,926 17	948 73	....	21,814 90
1835	....	11,850 00	....	....	....	10,275 83	1,412 96	6 33	23,543 12
1836	....	11,850 00	....	....	....	26,301 78	1,422 95	50 00	39,624 73
1837	....	11,850 00	....	....	....	30,471 56	1,459 73	45 00	43,826 29
1838	....	11,850 00	....	....	....	19,898 53	1,166 16	91 75	33,006 44
1839	....	11,850 00	....	....	....	23,594 36	1,712 01	88 98	37,245 35
1840	....	11,850 00	....	....	....	22,656 16	1,541 09	....	36,047 25
1841	....	11,850 00	....	2,055 41	....	16,330 33	1,509 56	....	31,745 30
1842	....	11,850 00	....	10,819 24	....	14,708 75	1,524 10	....	38,902 09
1843	....	11,850 00	....	....	....	10,953 48	1,454 16	....	24,257 64
1844	....	11,850 00	....	4 52	....	14,127 13	1,337 65	....	27,319 30
1845	....	11,850 00	....	....	....	13,853 68	1,496 66	56 90	27,257 24
1846	$150,000 00	9,975 00	....	....	....	12,947 02	1,567 50	....	174,489 52
1847	....	4,350 00	$10,377 25	756 40	....	14,099 37	1,526 51	149 25	31,258 78
1848	....	4,350 00	13,543 22	....	....	13,048 7	1,390 87	488 30	32,820 86
1849	71,886 00	3,262 50	....	51,932 60	....	11,923 64	1,280 00	101 90	140,386 64
1850	15,114 00	....	....	70,219 79	....	10,780 52	1,175 55	....	97,289 86
1851	....	....	3,737 58	7,038 48	....	20,894 51	1,517 81	78 50	33,296 88
1852	....	....	....	2,096 00	....	27,337 80	1,452 58	87 33	31,023 71
1853	....	....	....	14,223 35	....	14,502 06	1,530 29	15 15	30,270 85
1854	....	....	6,070 89	64,246 84	....	16,854 52	1,903 49	....	89,055 74
1855	....	....	11,187 33	117,821 09	....	10,557 72	2,170 76	....	141,736 90
1856	....	....	8,278 65	168,797 78	....	10,082 85	2,558 28	515 75	190,223 31
1857	....	....	3,734 23	136,589 28	....	12,688 50	3,034 62	29,905 81	186,042 44
1858	....	....	....	124,207 79	....	30,862 03	3,111 29	67,031 09	225,222 20
1859	....	....	8,276 51	36,840 22	....	5,278 55	2,397 46	30,472 45	83,265 19
1860	....	....	11,569 04	135,590 78	....	331 24	2,644 40	3,722 16	153.657 62
1861	....	....	....	84,308 31	....	17,010 38	2,307 26	19 12	106,245 07
1862	....	....	3,200 05	93,564 74	....	14,799 93	1,734 80	11,092 75	124,392 32
1863	....	....	7.603 15	44,293 70	....	3,159 49	1,373 21	12,320 46	68,750 01

1864			11,138 82	39,029 63		4,069 54	1,384 39	13,538 95	69,161 33
1865				64,334 92		373 03	1,581 04	31,094 78	97,383 77
1866			17,639 27	25,735 08		2,097 49	1,786 67	16,704 09	63,962 60
1867			8,310 52	4,931 89		382 81	1,769 99	18,593 14	33,988 35
1868			9,120 88	13,500 13			1,776 91	21,072 43	45,470 35
1869			12,717 03	11,295 22		1,291 63	1,759 00	20,142 92	47,205 80
1870				111,486 87		10,666 64	2,418 59	16,590 71	141,162 81
1871				31,505 88		39,374 37	2,373 29	316 93	73,570 47
1872				29,653 16		32,584 42	2,328 76	19 89	64,586 23
1873				14,165 70		17,622 53	2,256 42	19 89	34,064 54
1874				38,972 19		23,520 76	2,321 26	787 39	65,601 60
1875				29,027 02		23,673 19	2,227 91	1,209 31	56,137 43
1876				4,491 70		19,462 17	2,117 59		26,071 46
1877				2,698 93		14,917 58	1,691 46		19,307 97
1878				25,189 84		10,418 84	1,424 70	2,503 03	39,533 41
1879				3,813 25		6,507 05	1,182 81		11,503 11
1880				3,201 25		7,338 95	1,213 25		11,753 45
1881				8,033 82		5,851 73	1,077 71		14,963 26
1882				6,403 00		7,713 58	1,120 32	248 37	15,485 27
1883				2,992 12		7,731 28	672 57		11,395 97
1884				4,002 59		7,471 41	511 41	100 29	12,085 70
1885				7,795 13		7,514 18	504 86	94 33	15,908 50
1886				3,130 98		7,878 40	501 91		11,511 29
1887				9,364 29		7,818 97	504 06		17,687 92
1888				8,633 99		8,125 89	488 71	71 64	17,320 23
1889				22,064 49		8,294 14	617 67	1,636 81	32,613 11
1890				21,904 40		10,049 74	505 83	2,151 40	34,611 37
1891				8,656 87		9,352 43	448 80	126 33	18,584 43
1892				1,501 27		8,963 64	509 15		10,974 06
1893				2,306 36		6,938 09	404 00	69 71	11,718 16
1894				1,246 40		8,936 19	533 33	250 00	10,965 92
1895				36,555 62		10,796 14	361 66	4,611 43	52,324 85
1896				54,974 61		11,341 18	442 22	5,725 94	72,483 95
1897				31,057 99		11,092 53	743 73	726 87	43,621 12
1898				26,886 98		13,075 70	785 45	1,326 64	42,074 77
1899				8,909 34		12,184 23	433 42	1,280 00	22,806 99
1900				10,669 08		15,459 10	77 75	5,414 75	31,620 68
1901				77,844 72		14,510 45	75 00	9,277 29	101,707 46
1902				39,525 68		15,123 84	150 00	4,742 40	59,541 92
1903				25,220 40		14,388 56		2,410 38	42,019 34
1904				24,839 78		13,463 91	106 25	7,999 67	46,409 64
1905				16,299 32		14,091 76	58 32	2,298 93	32,748 33
1906				29,129 90		4,810 34	23 09	3,966 56	37,929 89
1907				33,059 73		1,500 00	30 14	5,572 60	40,162 47
1908				35,460 30		1,500 00	16 12	336 93	37,313 35
1909				31,067 37		1,500 00		7,322 93	39,890 30
1910				27,351 12		1,500 00		40,831 28	69,682 40
Total	$237,000 00	$237,404 83	$146,501 42	$2,40[illegible],491 39	$53,871 88	$975,020 70	$98,521 97	$121,976 [illegible]	$1,580,79[illegible] 01

*Nine months.

STATEMENT of Receipts and Payments on Account of the Black River Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	Loans.	Premiums on loans.	Discount on loans.	RECEIVED.							
				Avails of loans.	Temporary loans.	Interest on deposits.	From Sinking Fund.	From other funds.	Tolls.	Miscellaneous.	Total.
1837	$179,155 51	$14,079 66	....	$193,235 17	....	....	....	....	....	....	$193,235 17
1838	412,290 59	7,550 53	....	419,841 12	....	$11,825 65	....	....	....	....	431,666 17
1839	....	....	....	....	....	5,980 94	....	$46,462 96	....	....	52,443 90
1840	208,553 90	....	....	208,553 90	$150,000 00	2,719 89	....	243,634 70	....	....	604,908 49
1841	276,706 23	....	$26,706 23	250,000 00	200,000 00	2,487 21	....	....	....	....	452,487 21
1842	365,988 65	....	....	365,988 65	18,967 00	....	....	....	....	....	384,955 65
1843	50,305 12	....	....	50,305 12	....	....	....	....	....	....	50,305 12
1844	13,000 00	....	....	13,000 00	....	....	....	....	....	....	13,000 00
1845	38,000 00	....	....	38,000 00	....	....	....	....	....	....	38,000 00
1846	20,000 00	....	....	20,000 00	....	....	....	....	....	....	20,000 00
1847	....	....	....	....	....	....	$86,122 84	100,000 00	....	....	186,122 84
1848	....	....	....	....	....	....	86,122 84	149,563 83	....	....	235,686 67
1849	....	....	....	....	....	....	435,881 68	174,272 96	....	....	610,154 64
1850	....	....	....	....	....	....	61,203 63	100,618 44	$1,115 73	$2,093 09	165,030 89
1851	....	....	....	....	....	....	527,042 86	76,359 30	3,834 73	672 36	607,909 25
1852	....	....	....	....	....	....	334,964 06	119,194 41	4,166 05	64 23	458,388 75
1853	....	....	....	....	....	....	21,203 63	93,353 79	5,546 32	....	120,103 74
1854	....	....	....	....	....	....	21,203 63	55,686 72	5,843 42	....	82,733 77
1855	....	....	....	....	....	3,000 00	21,283 06	51,349 24	6,808 05	100 00	82,540 35
1856	....	....	....	....	....	2,000 00	21,203 63	54,837 44	5,594 10	5,668 14	89,303 31
1857	....	....	....	....	....	....	21,388 29	50,000 00	6,575 22	18,584 97	96,548 48
1858	....	....	....	....	....	....	285,551 03	103,088 04	4,998 48	172 13	393,809 68
1859	....	....	....	....	....	....	16,268 31	18,810 84	5,963 02	....	41,042 17
1860	....	....	....	....	....	....	66,768 85	100,325 28	6,330 71	....	173,424 84
1861	....	....	....	....	....	....	3,750 00	72,389 31	6,112 73	3,477 65	85,729 69
1862	....	....	....	....	....	....	53,900 00	41,147 54	8,647 84	244 86	103,940 22
1863	....	....	....	....	....	....	1,200 00	7,083 62	10,172 66	78 26	18,534 54
1864	....	....	....	....	....	....	20,900 00	17,606 77	10,078 30	....	48,585 07
1865	....	....	....	....	....	....	....	56,614 50	10,985 87	....	67,600 37
1866	....	....	....	....	....	....	....	6,783 99	11,802 81	1,647 01	20,233 81
1867	....	....	....	....	....	....	....	14,309 19	12,993 01		27,302 20
1868	....	....	....	....	....	....	....	14,210 66	10,432 62	....	24,643 28
1869	....	....	....	....	14,000 00	....	....	6,983 52	11,810 30	....	32,793 82
1870	....	....	....	....	....	....	....	....	11,992 24	54,232 60	66,224 84
1871	....	....	....	....	....	....	....	....	12,313 03	36,411 72	48,724 75

1872	....	....	....	....	....	....	....	....	10,838 86	31,938 19	42,777 05
1873	....	....	....	....	....	....	....	....	10,988 89	53,944 72	64,933 61
1874	....	....	....	....	....	....	....	....	10,589 93	323,732 48	334,322 41
1875	....	....	....	....	....	....	....	....	7,214 64	55,624 79	62,889 43
1876	....	....	....	....	....	....	....	....	11,339 28	3,105 55	14,444 83
1877	....	....	....	....	....	....	....	....	15,711 00	158 99	15,869 99
1878	....	....	....	....	....	....	....	....	12,906 52	332 08	13,238 60
1879	....	....	....	....	....	....	....	....	10,306 10	....	10,306 10
1880	....	....	....	....	....	....	....	....	11,724 16	75 51	11,799 67
1881	....	....	....	....	....	....	....	....	12,042 47	9,258 35	21,300 82
1882	....	....	....	....	....	....	....	....	13,217 55	75 24	13,292 79
1883	....	....	....	....	....	....	....	....	4,528 92	260 32	4,789 24
1884	....	....	....	....	....	....	....	....	....	52,533 60	52,533 60
1885	....	....	....	....	....	....	....	....	....	68,808 50	68,808 50
1886	....	....	....	....	....	....	....	....	....	54,886 20	54,886 20
1887	....	....	....	....	....	....	....	....	....	59,030 46	59,030 46
1888	....	....	....	....	....	....	....	....	....	67,311 43	67,311 43
1889	....	....	....	....	....	....	....	....	....	78,981 46	78,981 46
1890	....	....	....	....	....	....	....	....	....	104,527 93	104,527 93
1891	....	....	....	....	....	....	....	....	....	96,897 29	96,897 29
1892	....	....	....	....	....	....	....	....	....	80,664 86	80,664 86
1893	....	....	....	....	....	....	....	....	....	120,501 42	120,501 42
1894	....	....	....	....	....	....	....	....	....	99,867 61	99,867 61
1895	....	....	....	....	....	....	....	....	....	111,650 36	111,650 36
1896	....	....	....	....	....	....	....	....	....	139,689 59	139,689 59
1897	....	....	....	....	....	....	....	....	....	223,468 14	223,468 14
1898	....	....	....	....	....	....	....	....	....	236,093 69	236,093 69
1899	....	....	....	....	....	....	....	....	....	56,184 41	56,184 41
1900	....	....	....	....	....	....	....	....	....	147,642 40	147,642 40
1901	....	....	....	....	....	....	....	....	....	111,022 06	111,022 06
1902	....	....	....	....	....	....	....	....	....	141,062 40	141,062 40
1903	....	....	....	....	....	....	....	....	....	165,909 78	165,909 78
1904	....	....	....	....	....	....	....	....	....	89,362 41	89,362 41
1905	....	....	....	....	....	....	....	....	....	133,795 51	133,795 51
1906	....	....	....	....	....	....	....	....	....	96,569 15	96,569 15
1907	....	....	....	....	....	....	....	....	....	52,111 45	52,111 45
1908	....	....	....	....	....	....	....	....	....	96 957 41	96,957 41
1909	....	....	....	....	....	....	....	....	....	76 409 22	76,409 22
1910	....	....	....	....	....	....	....	....	....	105,503 74	105,503 74
Total......	$1,564,000 00	$21,630 19	$26,706 23	$1,558,923 96	$382,967 00	$28,013 69	$2,085,958 34	$1,774,687 05	$305,525 54	$3,469,395 72	$9,605,471 30
Deficiencies paid by General Fund and Erie and Champlain Canals..........											1,817,427 50
											$11,422,898 80

BLACK RIVER CANAL.

YEAR.	DEFICIENCIES.		PAID.							
	Paid by the General Fund.	Paid by the Erie and Champlain canals.	Principal of the loans.	Temporary loans.	Interest on loans.	Canal Commissioners and Superintendent of Public Works.	Superintendents.	Collectors.	Miscellaneous.	Total.
1837	...	...	...	...	$2,239 44	$5,255 55	...	...	...	$7,494 99
1838	...	...	...	...	29,263 97	97,735 21	...	...	$125 00	127,124 18
1839	...	...	...	...	29,572 28	513,154 39	...	...	...	542,726 67
1840	$58,711 89	...	...	...	39,792 87	537,791 74	...	...	110 39	577,698 00
1841	...	$50,681 18	...	$150,000 00	53,168 39	335,973 06	...	...	32 88	539,174 33
1842	...	74,186 24	...	200,000 00	74,186 24	234,824 34	...	...	47 75	509,058 33
1843	...	81,641 08	...	...	81,641 08	24,928 61	...	...	...	106,569 69
1844	...	83,171 09	...	18,967 00	83,171 09	14,528 33	...	...	480 75	117,147 17
1845	...	84,400 46	...	...	84,400 46	39,147 14	...	...	672 95	124,220 55
1846	...	85,240 30	...	...	85,240 30	12,852 14	...	...	820 12	98,912 56
1847	...	...	...	...	86,122 84	12,326 24	...	...	545 66	98,994 74
1848	...	...	...	...	86,122 84	108,522 95	...	...	9,262 37	203,908 16
1849	...	...	$355,988 65	...	79,893 03	233,373 97	...	...	112 25	669,367 90
1850	...	8,898 79	...	...	61,203 63	151,492 03	$10,014 52	...	216 16	222,926 34
1851	...	22,236 53	486,514 85	...	40,528 01	95,590 17	25,753 83	$317 43	1,046 26	649,750 55
1852	...	25,704 22	313,485 15	...	21,478 91	118,356 30	29,404 55	529 95	838 11	484,092 97
1853	...	19,423 53	...	...	21,203 63	31,957 28	24,443 88	525 97	395 44	78,526 20
1854	...	31,608 39	...	...	21,203 63	33,026 36	30,500 35	554 15	329 20	85,613 69
1855	...	29,616 30	...	...	21,203 63	105,539 77	35,671 38	752 97	364 20	163,531 95
1856	...	12,191 33	...	...	21,203 63	93,437 29	10,885 81	764 34	13,587 81	139,848 88
1857	...	8,423 15¾	...	...	21,203 63	61,664 72	1,613 45	783 67	19,706 16	104,971 63
1858	...	14,123 15	267,806 23	...	17,744 80	41,297 38	3,062 48	824 40	35,510 74	366,246 03
1859	...	21,607 03	8,900 00	...	7,368 31	16,023 62	1,843 98	627 86	28,010 29	62,774 06
1860	...	18,646 54	60,305 12	...	6,463 73	101,030 62	366 66	862 67	21,929 80	190,958 60
1861	...	17,192 05	...	...	3,750 00	103,593 31	6,173 28	667 13	17,264 93	131,448 65
1862	...	14,935 27	51,000 00	...	2,900 00	33,870 86	2,183 53	640 85	21,528 04	112,123 28
1863	...	10,696 18	...	...	1,200 00	10,053 54	3,491 19	574 76	25,066 18	40,385 67
1864	...	13,565 12	20,000 00	...	900 00	1,860 84	6,142 25	503 16	19,352 93	48,759 18
1865	...	48,912 70	...	...	...	30,229 68	9,582 68	613 25	41,636 22	82,061 83
1866	...	37,863 39	...	...	...	25,339 11	13,745 68	697 76	33,279 50	73,062 05
1867	...	30,732 14	...	...	...	30,502 78	2,538 30	709 00	41,140 26	74,890 34
1868	...	25,720 68	...	...	...	31,011 41	...	757 07	35,729 48	67,497 96
1869	...	57,712 25	...	...	...	29,773 26	5,168 00	1,352 09	62,580 26	98,873 61

1870	....	189,417 75	....	....	....	60,814 40	49,913 31	1,913 83	142,441 05	255,082 59
1871	....	117,975 12	....	....	....	54,055 39	98,494 22	1,981 26	12,169 00	166,699 87
1872	....	76,702 30	....	....	....	32,187 53	73,726 94	1,735 16	11,829 72	119,479 35
1873	....	59,679 84	....	....	....	55,469 14	67,429 50	1,659 23	55 58	124,613 45
1874	....	52,956 57	....	....	....	299,778 78	60,715 18	1,335 73	25,449 29	387,278 98
1875	....	38,661 03	....	....	....	53,744 68	40,727 07	1,034 50	5,994 21	101,500 46
1876	....	23,734 85	....	....	....	3,430 18	33,564 38	1,059 75	125 37	38,179 63
1877	....	38,500 24	....	....	....	257 17	53,035 32	1,076 42	12 32	54,381 23
1878	....	23,820 89	....	....	....	3,806 44	32,184 96	1,033 86	34 23	37,059 49
1879	....	32,272 99	....	....	....	15,785 09	25,761 64	1,032 36	....	42,579 09
1880	....	39,592 88	....	....	....	24,013 79	26,336 62	1,042 14	....	51,392 55
1881	....	59,736 68	....	....	....	54,609 91	25,243 50	905 41	278 68	81,037 50
1882	....	31,904 96	....	....	....	13,278 58	30,842 17	1,070 44	6 56	45,197 75
1883	....	44,619 42	....	....	....	14,572 35	33,925 27	897 01	838 96	50,233 59
1884	....	....	....	....	....	18,971 05	32,512 71	983 44	66 40	52,533 60
1885	....	....	....	....	....	35,419 70	32,138 42	969 63	280 75	68,808 50
1886	....	....	....	....	....	19,604 41	34,205 50	990 13	86 16	54,886 20
1887	....	....	....	....	....	22,948 91	35,053 07	969 08	59 40	59,030 46
1888	....	....	....	....	....	31,701 24	34,641 87	965 32	....	67,311 43
1889	....	....	....	....	....	36,638 20	38,730 38	1,111 47	2,501 41	78,981 46
1890	....	....	....	....	....	57,191 80	44,244 61	984 63	2,106 89	104,527 93
1891	....	....	....	....	....	53,301 01	38,649 76	1,196 31	3,750 21	96,897 29
1892	....	....	....	....	....	36,823 17	39,480 52	969 11	3,392 06	80,664 86
1893	....	....	....	....	....	76,645 01	36,903 52	953 06	5,999 83	120,501 42
1894	....	....	....	....	....	55,297 56	39,609 46	964 59	3,996 00	99,867 61
1895	....	....	....	....	....	65,340 27	40,975 85	481 46	4,852 78	111,650 36
1896	....	....	....	....	....	91,970 40	38,388 86	524 03	8,806 30	139,689 59
1897	....	....	....	....	....	180,405 18	39,162 69	1,024 93	2,875 34	223,468 14
1898	....	....	....	....	....	196,442 16	35,553 58	1,043 86	3,054 09	236,093 69
1899	....	....	....	....	....	27,192 83	28,119 51	686 70	185 37	56,184 41
1900	....	....	....	....	....	100,066 12	38,165 74	775 58	8,634 96	147,642 40
1901	....	....	....	....	....	72,697 20	35,440 46	553 23	2,331 17	111,022 06
1902	....	....	....	....	....	88,317 56	37,479 80	612 87	14,652 17	141,062 40
1903	....	....	....	....	....	117,422 92	37,012 19	497 66	11,157 01	165,909 78
1904	....	....	....	....	....	46,511 32	38,652 17	490 57	3,708 35	89,362 41
1905	....	....	....	....	....	54,430 54	11,328 46	488 00	67,548 51	133,795 51
1906	....	....	....	....	....	94,629 84	....	473 09	1,466 22	96,569 15
1907	....	....	....	....	....	50,345 64	834 68	495 08	436 05	52,111 45
1908	....	....	....	....	....	55,060 22	1,500 00	488 83	39,908 36	96,957 41
1909	....	....	....	....	....	74,250 33	1,500 00	494 26	164 63	76,409 22
1910	....	....	....	....	....	102,774 04	1,500 00	441 10	785 60	105,503 74
Total	$58,711 89	$1,758,715 61	$1,564,000 00	$368,967 00	$1,084,370 37	$5,264 038 97	$1,666,242 60	$41 466 60	$813,763 08	$11,422,838 80

STATEMENT of Receipts and Payments on Account of the Chemung Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	Loans.	Premiums on loans.	Discounts on loans.	RECEIVED.						
				Avails of loans.	Temporary loans.	From Sinking Fund.	Interest on deposits.	Tolls.	Miscellaneous.	Total.
1830	$150,000 00	$15,694 00	....	$165,694 00	....	....	....	....	....	$165,694 00
1831*	140,263 00	21,179 71	....	161,442 71	....	....	....	....	$2,818 66	164,261 37
1832	....	....	....	....	....	....	....	....	1,057 66	1,057 66
1833	25,737 00	4,506 55	....	30,243 55	....	....	....	....	2,072 98	32,316 53
1834	....	....	....	....	....	....	....	$2,398 39	....	2,398 39
1835	....	....	....	....	....	....	....	4,153 07	27 40	4,180 47
1836	....	....	....	....	....	....	....	5,078 37	275 00	5,353 37
1837	....	....	....	....	....	....	....	4,342 99	22 69	4,365 68
1838	....	....	....	....	....	....	....	4,478 01	....	4,478 01
1839	....	....	....	....	....	....	....	4,767 62	....	4,767 62
1840	....	....	....	....	....	....	....	5,011 50	....	5,011 50
1841	114,292 23	....	$14,292 23	100,000 00	....	....	$526 39	7,158 18	....	107,684 57
1842	172,830 24	....	....	172,830 24	$20,000 00	....	....	7,206 28	....	200,036 52
1843	53,478 11	....	....	53,478 11	....	....	....	9,188 51	....	62,666 62
1844	7,000 00	....	....	7,000 00	....	....	....	12,950 92	....	19,950 92
1845	....	....	....	....	....	....	....	20,281 70	....	20,281 70
1846	....	....	....	....	....	....	....	15,862 99	....	15,862 99
1847	....	....	....	....	....	$35,934 59	....	13,677 28	....	49,611 87
1848	....	....	....	....	....	35,934 59	....	16,821 58	....	52,756 17
1849	....	....	....	....	....	172,647 73	....	16,048 96	7,120 88	195,817 57
1850	....	....	....	....	....	296,105 18	....	16,276 54	14,194 20	326,575 92
1851	....	....	....	....	....	53,066 32	....	15,986 04	2,620 00	71,672 36
1852	....	....	....	....	....	11,177 76	....	15,683 31	....	26,861 07
1853	....	....	....	....	....	10,394 21	....	20,810 23	....	31,204 44
1854	....	....	....	....	....	10,394 21	....	19,635 35	....	30,029 56
1855	....	....	....	....	....	10,394 21	....	19,771 91	6,971 63	37,107 75
1856	....	....	....	....	....	10,394 21	....	17,111 13	1,744 11	29,249 45
1857	....	....	....	....	....	10,394 21	....	17,101 71	....	27,495 92
1858	....	....	....	....	....	10,394 21	....	13,347 95	....	23,742 16
1859	....	....	....	....	....	10,394 21	....	16,868 66	606 27	27,869 14
1860	....	....	....	....	....	63,070 15	....	18,579 46	35 78	81,685 39
1861	....	....	....	....	....	135,033 11	....	15,319 04	72	150,352 87
1862	....	....	....	....	....	7,233 33	....	19,901 96	2,459 42	29,594 71
1863	....	....	....	....	....	....	....	21,628 77	4,583 02	26,211 79
1864	....	....	....	....	....	....	....	23,406 86	15,837 85	39,244 71
1865	....	....	....	....	....	....	....	16,745 91	31,678 14	48,424 05
1866	....	....	....	....	....	....	....	18,173 04	86,357 91	104,530 95
1867	....	....	....	....	....	....	....	14,523 14	91,220 91	105,744 05

1868								12,222 98	25,839 11	38,062 09
1869								9,514 27	39,661 95	49,176 22
1870								5,984 90	86,323 46	92,308 36
1871								6,187 79	94,498 07	100,685 86
1872								4,120 81	35,550 15	39,670 96
1873								3,729 06	32,810 05	36,539 11
1874								2,914 44	6,915 77	9,830 21
1875								1,717 32	14,426 49	16,143 81
1876								2,104 84	7,976 21	10,081 05
1877								3,211 64		3,211 64
1878								2,678 55	34,982 67	37,661 22
1879								742 01	3,787 70	4,529 71
1880									124 32	124 32
1881										
1882									523 47	523 47
1883, 1884										
1885									1,017 10	1,017 10
1886									953 43	953 43
1887									3,650 00	3,650 00
1888										
1889									4,204 56	4,024 56
1890									15,203 03	15,203 03
1891									8,407 36	8,407 36
1892									15,434 60	15,434 60
1893									2,465 50	2,465 50
1894									5,770 14	5,770 14
1895									14,943 29	14,943 29
1896									41,878 36	41,878 36
1897									8,047 63	8,047 63
1898									2,497 44	2,497 44
1899									576 27	576 27
1900									9,288 28	9,288 28
1901									5,063 42	5,063 42
1902										
1903									381 88	381 88
1904									110 00	110 00
1905									2,114 34	2,114 34
1906									2,007 59	2,007 59
1907									8,006 25	8,006 25
1908									2,160 90	2,160 90
1909									2,304 33	2,304 33
1910									586 45	586 45
Total	$663,600 58	$41,380 26	$14,292 23	$690,688 61	$20,000 00	$882,962 23	$526 39	$525,425 97	$812,016 80	$2,931,620 00
Deficiencies paid by General Fund and Erie and Champlain canals										1,967,021 62
										$4,898,641 62

*Nine months.

CHEMUNG CANAL.

YEAR	DEFICIENCIES.		PAID.							
	Paid by the General Fund.	Paid by the Erie and Champlain canals.	Principal of loans.	Temporary loans.	Interest on loans.	Canal Commissioners and Superintendent of Public Works.	Superintendents of repairs.	Collectors.	Miscellaneous.	Total
1830	....	....	....	....	$3,125 00	$69,190 00	....	....	....	$72,315 00
1831*	....	....	....	....	7,378 29	148,291 57	....	....	$2 10	155,671 96
1832	....	....	....	....	14,513 16	75,410 47	....	....	16 05	89,939 68
1833	$43,730 28	....	....	....	14,891 29	47,793 38	$26,448 53	....	400 00	89,533 20
1834	40,723 55	....	....	....	15,800 04	2,258 91	23,703 4[illegible]	$696 48	263 03	42,721 94
1835	23,841 29	....	....	....	15,800 04	9 08	11,175 89	1,036 75	....	28,021 76
1836	21,107 70	....	....	....	15,800 03	....	9,623 16	1,037 88	....	26,461 07
1837	31,278 06	....	....	....	15,800 00	3,558 79	15,193 82	1,091 13	....	35,643 74
1838	29,833 11	....	....	....	15,800 00	1,859 91	12,106 16	992 97	3,552 08	34,311 12
1839	26,536 03	....	....	....	15,800 00	....	14,315 71	1,187 94	....	31,303 65
1840	24,094 57	....	....	....	15,800 00	68 50	11,969 24	1,268 33	....	29,106 07
1841	....	$35,702 40	....	....	18,535 21	100,056 81	23,175 22	1,201 54	103 39	143,072 17
1842	....	53,151 75	$7,000 00	....	25,830 21	185,987 49	33,451 59	1,076 23	157 55	253,503 07
1843	....	41,086 27	8,000 00	$20,000 00	34,629 11	25,417 46	14,486 27	1,159 40	60 65	103,752 89
1844	....	35,985 80	....	....	35,678 69	3,467 07	12,172 23	1,085 80	224 60	52,628 39
1845	....	34,100 95	....	....	35,862 88	9 90	17,280 27	1,239 50	576 00	51,968 55
1846	....	36,225 87	....	....	35,914 31	1,646 00	14,689 55	1,455 00	109 00	53,843 86
1847	....	7,730 12	....	....	35,934 59	4,360 86	15,485 39	1,561 15	13 01	57,355 00
1848	....	12,789 76	....	....	35,934 59	328 66	27,080 33	2,030 00	172 35	65,545 93
1849	....	23,040 32	139,148 24	....	33,499 49	19,876 96	23,897 06	2,136 00	1,254 56	219,812 31
1850	....	54,154 10	272,724 64	....	23,380 54	53,768 39	28,885 79	1,896 21	74 45	380,730 02
1851	....	37,426 19	42,495 06	....	10,571 26	11,044 92	42,330 76	2,566 35	99 20	109,098 55
1852	....	21,681 48	780 30	....	10,397 46	2,144 06	32,952 17	2,198 36	70 20	48,542 55
1853	....	18,626 28	....	....	10,394 21	12,665 24	23,883 28	2,214 84	673 15	49,830 72
1854	....	18,963 53	....	....	10,394 21	3,047 11	33,090 05	2,187 62	265 10	48,993 09
1855	....	5,660 85	....	....	10,394 21	6,971 63	23,094 86	2,252 97	84 93	42,796 60
1856	....	3,424 12	....	....	10,394 21	3,223 28	4,652 49	2,403 11	12,000 48	32,673 57
1857	....	91,179 43	....	....	10,394 21	29,988 16	66,101 23	2,435 05	9,756 70	118,675 35
1858	....	179,310 77	....	....	10,394 21	28,345 22	161,702 33	2,604 84	6 35	203,052 93
1859	....	47,193 37	....	....	10,394 21	39,026 41	18,786 02	2,195 01	4,665 83	75,067 51
1860	....	67,239 14	53,478 11	....	9,592 04	69,787 13	316 67	3,264 81	12,485 77	148,924 53
1861	....	33,436 14	132,974 23	....	2,058 88	20,828 36	6,510 67	2,623 39	18,788 48	183,789 01
1862	....	90,100 53	7,000 00	....	233 33	81,911 75	7,628 96	2,291 62	20,626 58	119,695 24
1863	....	83,053 63	....	....	....	34,356 39	53,324 59	2,256 50	19,327 91	109,265 42

1864		49,782 94				48,290 86	12,859 91	2,392 74	25,484 14	89,027 65
1865		87,357 58				43,486 76	16,713 24	2,845 55	72,736 08	135,781 63
1866		45,311 69				94,784 34	18,218 19	3,189 21	33,650 90	149,842 64
1867		65,714 98				86,708 79	3,207 04	3,318 19	78,225 01	171,459 03
1868		51,145 31				38,108 40		2,981 94	48,117 06	89,207 40
1869		31,550 41				40,185 18	1,431 17	3,110 28	36,000 00	80,726 63
1870		50,981 03				107,850 46	826 69	3,821 28	30,790 96	143,289 39
1871		91,457 15				97,761 57	2,912 31	3,801 68	87,667 45	192,143 01
1872		79,313 99				47,584 64	30,061 79	3,740 84	37,597 68	118,984 95
1873		33,287 53				31,593 17	31,867 65	3,696 98	2,668 84	69,826 64
1874		35,676 51				7,820 06	34,004 86	3,681 80		45,506 72
1875		24,045 88				14,398 22	20,815 02	2,547 79	2,428 66	40,189 69
1876		7,689 87				10,515 01	5,202 27	1,652 99	400 65	17,770 92
1877		18,494 81					20,657 21	1,049 24		21,706 45
1878		6,431 61				35,235 72	7,479 51	503 78	873 82	44,092 83
1879		4,145 40				4,943 51	3,413 16	223 74	94 70	8,675 11
1880		6,119 07				1,933 65	4,309 74			6,243 39
1881		6,103 47				6,103 47				6,103 47
1882						503 45			20 02	523 47
1883, 1884										
1885						1,006 82			10 28	1,017 10
1886						925 00			28 43	953 43
1887						3,650 00				3,650 00
1888										
1889						3,237 50			787 06	4,024 56
1890						14,007 92			1,195 11	15,203 03
1891						7,752 62			654 74	8,407 36
1892						12,547 98			2,886 62	15,434 60
1893									2,465 50	2,465 50
1894						4,815 28			954 86	5,770 14
1895						13,681 65			1,261 64	14,943 29
1896						23,916 19			17,962 17	41,878 36
1897						7,525 15			522 48	8,047 63
1898						2,345 54			151 90	2,497 44
1899						217 19			359 08	576 27
1900						4,031 16			5,257 12	9,288 28
1901						4,759 90			303 52	5,063 42
1902										
1903						200 00			181 88	381 88
1904						110 00				110 00
1905						1,975 43			138 91	2,114 34
1906									2,007 59	2,007 59
1907						7,260 68			745 57	8,006 25
1908						2,160 90				2,160 90
1909						2,304 33				2,304 33
1910						586 45				586 45
Total	$241,144 59	$1,725,877 03	$663,600 58	$20,000 00	$571,349 91	$1,923,524 85	$1,023,502 53	$96,212 79	$600,450 96	$4,898,641 62

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* Nine months.

STATEMENT of Receipts and Payments on Account of the Chenango Canal, in Each Year, up to September 30, 1910, *inclusive, viz.:*

YEAR.	Loans.	Premium on loans.	Discount on loans.	RECEIVED.					
				Avails of loans.	Erie and Champlain tolls to redeem stock.	From Sinking Fund.	Tolls.	Miscellaneous.	Total.
1833	$50,000 00	$7,755 00		$57,755 00					$57,755 00
1834	950,000 00	66,255 00		1,016,255 00				$3,438 69	1,019,693 69
1835								49,229 42	49,229 42
1836	650,000 00	13,000 00		663,000 00				3,075 33	666,075 33
1837	620,000 00	5,979 67		625,979 67			$4,081 62	90 23	630,151 52
1838	92,535 66			92,535 66			16,751 12	125 00	109,411 78
1839	20,000 00	500 00		20,000 00			18,050 33		38,550 33
1840	20,000 00		$975 00	19,025 00			14,023 32	114 00	33,162 32
1841							16,893 02		16,893 02
1842	6,102 34			6,102 34			15,330 57		21,423 91
1843	8,362 00			8,362 00			14,668 94		23,030 94
1844	3,000 00			3,000 00			20,983 05		23,983 05
1845							23,920 66		23,920 66
1846					$2,362,535 66		25,578 76		2,388,114 42
1847						$3,278 88	25,620 01		28,898 89
1848						3,278 88	28,091 66	6,591 56	37,962 10
1849						9,274 43	28,028 98	3,527 45	40,830 86
1850						2,851 72	20,343 65	7,801 91	30,997 28
1851						2,351 72	19,732 35	973 55	23,057 62
1852						21,651 72	16,891 62	30 24	38,573 58
1853						1,651 72	18,107 89		19,759 61
1854						20,901 72	19,496 15		40,397 87
1855						651 72	20,302 08	3,097 35	24,051 15
1856						651 72	18,634 62	204 66	19,491 00
1857						651 72	22,969 47		23,621 19
1858						651 72	15,305 64	127 43	16,084 79
1859						651 72	17,801 72	1,799 02	20,252 46
1860						8,888 29	22,214 37	11,472 00	42,574 66
1861						150 00	23,397 24	41 46	23,588 70
1862						3,100 00	22,155 94		25,255 94
1863							24,354 87	5,794 66	30,149 53
1864							30,034 43	774 68	30,809 11
1865							21,710 98	15,850 45	37,561 43
1866							28,534 53	164,227 97	192,762 50
1867							28,871 49	567,082 00	595,953 49

1868							25,074 73	174,779 17	199,853 90
1869							21,654 01	257,246 72	279,080 73
1870							20,544 55	408,504 29	249,048 84
1871							8,981 38	141,928 97	150,910 35
1872							5,690 67	210,804 64	216,495 31
1873							4,061 22	222,823 24	226,884 46
1874							4,664 29	135,882 26	140,546 55
1875							2,909 63	11,270 20	14,179 83
1876							3,096 32	2,542 82	5,639 14
1877							1,159 18	4,919 23	6,078 41
1878								5,008 80	5,008 80
1879								704 50	704 50
1880								1,341 35	1,341 35
1881								791 15	791 15
1882								188 30	188 30
1883								707 48	707 48
1884								4,324 20	4,324 20
1885								14,918 61	14,918 61
1886								5,605 56	5,605 56
1887								2,111 10	2,111 10
1888								1,426 23	1,426 23
1889								3,222 13	3,222 13
1890								1,383 03	1,383 03
1891								971 42	971 42
1892								4,572 91	4,572 91
1893								23,436 39	23,436 39
1894								8,948 74	8,948 74
1895								12,454 48	12,454 48
1896								3,609 55	3,609 55
1897								13,083 21	13,083 21
1898								26,095 57	26,095 57
1899									
1900								210 53	210 53
1901									
1902									
1903									
1904									
1905									
1906									
1907									
1908									
1909									
1910									
Total	$2,420,000 00	$93,489 67	$975 00	$2,512,514 67	$2,362,535 66	$80,637 68	$740,717 06	$2,551,465 84	$8,247,870 91
Deficiencies paid by General Fund and Erie and Champlain canals									2,447,527 76
									$10,695,398 67

CHENANGO CANAL.

YEAR.	DEFICIENCIES.		PAID.						
	Paid by the General Fund.	Paid by the Erie and Champlain canals.	Principal of loans.	Interest on loans.	Surplus tolls to Erie and Champlain canals.	Canal Commissioners and Superintendent of Public Works.	Superintendents of repairs.	Expenses of collectors and inspectors.	Miscellaneous.	Total.
1833	....	....	....	$1,042 81	....	$9,222 65	....	....	$57 33	$10,322 79
1834	....	....	....	25,619 86	....	211,013 44	....	....	....	236,633 30
1835	....	....	....	50,000 00	....	651,782 45	....	....	67 36	701,849 81
1836	....	....	....	65,637 81	....	911,035 10	....	....	228 90	976,901 81
1837	$102,749 16	....	....	88,227 39	....	480,807 02	$18,663 62	....	315 81	588,013 84
1838	136,042 97	....	....	133,445 66	....	65,759 17	20,270 95	$1,074 85	35 48	220,586 11
1839	118,994 25	....	....	118,426 80	....	47,458 98½	16,990 64	1,576 00	803 60	185,256 02½
1840	121,774 37	....	....	119,576 79	....	12,232 90	14,775 24	1,559 66	4,417 36½	152,561 95½
1841	....	$122,003 21	....	120,326 76	....	5,349 47	16,638 05	1,931 42	563 88	144,809 58
1842	....	125,408 50	....	120,450 79	....	5,075 33	18,467 28	1,821 00	6,291 85	152,106 25
1843	....	123,618 04	....	120,974 23	....	668 05	15,917 35	1,395 40	2,624 08	141,579 11
1844	....	117,246 44	....	121,295 96	....	3,942 72	15,700 51	1,233 02	1,346 59	143,518 80
1845	....	116,936 47	....	121,374 89	....	153 95	18,283 33	1,198 91	....	141,011 08
1846	....	26,799 40	$2,336,310 66	33,219 03	....	152 47	17,827 13	1,332 00	730 98	2,389,572 27
1847	....	....	22,195 00	3,278 88	$3,983 97	2,704 28	18,404 54	1,226 00	842 77	52,635 44
1848	....	....	3,430 00	3,278 88	5,897 85	119 06	20,471 02	1,418 49	7,264 72	41,880 02
1849	....	1,621 35	6,702 34	3,172 09	....	817 88	27,772 21	1,442 12	2,785 57	42,692 21
1850	....	6,037 60	....	2,851 72	....	5,051 91	25,071 12	1,237 68	2,822 45	37,034 88
1851	....	12,975 92	....	2,351 72	....	1,064 75	31,110 32	1,426 08	80 67	36,033 54
1852	....	25,236 34	20,000 00	1,651 72	....	6,112 00	34,706 26	1,339 94	....	63,809 92
1853	....	21,143 62	....	1,651 72	....	....	37,752 37	1,400 79	98 35	40,903 23
1854	....	31,383 42	20,000 00	901 72	....	....	49,476 20	1,403 37	....	71,781 29
1855	....	25,502 96	....	651 72	....	3,095 35	44,250 04	1,557 00	....	49,554 11
1856	....	6,009 47	....	651 72	....	1,589 35	10,301 24	1,723 86	11,234 30	25,500 47
1857	....	7,196 60	....	651 72	....	160 00	2,276 18	1,923 39	25,806 50	30,817 79
1858	....	32,011 08	....	651 72	....	616 21	23,785 09	1,981 10	21,061 75	48,095 87
1859	....	10,077 39	....	651 72	....	1,933 72	3,450 19	1,383 66	22,910 56	30,329 85
1860	....	8,619 89	8,362 00	526 29	....	11,757 84	1,893 95	1,761 57	25,175 90	49,477 55
1861	....	40,046 00	....	150 00	....	39,097 72	1,210 98	1,744 35	21,431 65	63,634 70
1862	....	21,564 25	3,000 00	100 00	....	12,577 91	1,215 98	1,860 74	28,065 56	46,820 19
1863	....	13,474 28	....	....	....	9,357 43	1,620 78	1,904 36	31,741 24	44,623 81
1864	....	51,062 20	....	....	....	38,410 12	3,210 97	2,107 10	38,143 12	81,871 31
1865	....	117,597 57	....	....	....	51,983 95	4,039 74	2,654 17	96,481 14	155,159 00
1866	....	89,116 18	....	....	....	191,021 01	12,333 31	2,888 49	76,352 87	282,559 68
1867	....	116,143 40	....	....	....	654,088 55	2,363 48	2,809 85	52,835 01	712,096 89

1868		123,756 43				256,122 72		2,471 68	65,015 93	323,610 33
1869		33,087 29				261,536 00	3,249 98	2,775 52	44,606 52	312,168 02
1870		112,550 97				447,647 79	17,373 56	2,935 89	73,615 57	541,599 81
1871		176,714 22				194,130 89	87,776 30	2,531 14	43,186 24	327,624 57
1872		117,252 29				246,110 64	47,861 67	2,460 08	37,315 21	333,747 60
1873		36,811 31				205,216 43	29,831 05	2,435 17	26,213 12	263,695 77
1874		39,284 23				119,328 09	40,705 25	2,450 24	17,347 20	179,830 78
1875		20,994 59				8,810 51	24,242 21	1,584 11	537 59	35,174 42
1876		4,602 03				1,803 33	7,735 08	557 08	145 68	10,241 17
1877		6,563 70				4,750 04	6,171 34	237 50	1,483 23	12,642 11
1878		2,759 73				5,940 23	1,758 51		69 79	7,768 53
1879		8,878 57				7,850 91	1,722 79		9 37	9,583 07
1880		6,282 59				6,134 59	1,459 50		29 85	7,623 91
1881		4,345 04				3,989 27	1,127 27		19 65	5,136 19
1882		2,895 37				2,833 67	250 00			3,083 67
1883		2,717 07				3,417 07			7 48	3,424 55
1884						4,324 20				4,324 20
1885						14,633 77			284 84	14,918 61
1886						5,561 23			41 33	5,605 56
1887						2,081 39			29 71	2,111 10
1888						1,426 23				1,426 23
1889						3,222 13				3,222 13
1890						1,254 52			128 51	1,383 03
1891						971 42				971 42
1892						4,499 40			73 51	4,572 91
1893						21,332 96			2,103 43	23,436 39
1894						8,448 74			500 00	8,948 74
1895						1,891 90			10,562 58	12,445 48
1896						1,384 55			2,225 00	3,609 55
1897						13,083 21				13,083 21
1898						26,095 57				26,095 57
1899										
1900									210 53	210 53
1901										
1902										
1903										
1904										
1905										
1906										
1907										
1908										
1909										
1910										
Total	$479,560 75	$1,967,967 01	$2,420,000 00	$1,262,792 12	$9,881 82	$5,322,076 14½	$801,514 58	$70,754 78	$808,379 22½	$10,695,398 67

STATEMENT of Receipts and Payments on Account of the Genesee Valley Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	Loans.	Premium on loans.	Discount on loans.	RECEIVED.							
				Avails of loans.	Temporary loans.	From Sinking Fund.	From other funds.	Tolls.	Interest on deposits.	Miscellaneous.	Total.
1837	$11,764 71	$1,315 29		$13,080 00							$13,080 00
1838	1,988,235 29	791 26		1,989,026 55					$90,120 52		2,079,147 07
1839			$25,000 00						64,580 14		64,580 14
1840	250,000 00		31,379 82	225,000 00	$100,000 00				25,926 30		350,926 30
1841	306,379 82			275,000 00	455,000 00			$12,275 44	4,092 70		746,368 14
1842	810,376 62			810,376 62				12,075 97			822,452 59
1843	186,243 56	10,000 00		196,243 56				13,734 52			209,978 08
1844	186,000 00	3,000 00		189,000 00				18,586 52			297,586 52
1845	55,000 00			55,000 00				20,484 17			75,484 17
1846	91,000 00			91,000 00				24,182 60			115,182 60
1847						$213,129 97	$128,000 00	25,055 20			366,185 17
1848						213,129 97	216,960 88	26,012 50	1,092 60		457,195 95
1849						999,500 00	177,575 34	25,234 04	637 35		1,202,946 73
1850						157,103 61	132,702 65	28,821 98		$22,236 61	340,864 85
1851						157,103 61	139,246 62	25,451 36		7,542 12	329,343 71
1852						157,103 61	209,077 29	25,064 39			391,245 29
1853						157,103 61	259,786 98	30,183 73			447,074 32
1854						158,726 27	66,425 10	30,662 08			255,813 45
1855						172,148 84	119,437·89	28,390 12	1,500 00		321,476 85
1856						157,295 61	90,986 41	23,365 84	2,000 00	3,568 16	277,216 02
1857						189,296 88	32,000 00	25,966 70		11,723 56	258,987 14
1858						693,199 08	110,955 64	25,651 07			829,805 79
1859						142,831 61	10,053 80	28,163 93		785 01	181,834 35
1860						322,584 52	75,256 03	30,801 74		330 08	428,972 37
1861						1,992,510 00	24,898 34	29,189 60		512 71	2,047,105 65
1862						277,493 33	66,052 80	28,697 27		100 00	372,343 40
1863						22,460 00	10,924 68	32,747 98			66,132 66
1864						95,095 00	14,878 95	27,562 66		267 91	137,804 52
1865							52,853 19	15,785 16		2,625 25	71,263 60
1866							73,638 57	17,724 01		48 81	91,411 39
1867							64,960 16	25,394 63			90,354 79
1868							25,123 91	23,770 88			48,894 79
1869						10,000 00	156,024 57	22,416 80		30 00	188,271 37
1870							236,474 45	17,736 36		911 84	255,122 65
1871							121,600 83	18,895 17			140,496 00

1872							19,590 68	18,828 36		846 47	39,265 51
1873							75,289 83	26,313 99			101,603 82
1874								16,441 23		54,025 87	70,467 10
1875								12,406 26		25,040 14	37,446 40
1876								14,668 50		7,961 93	22,630 43
1877								19,533 79		4,624 53	24,158 32
1878								9,530 25		423 99	9,954 24
1879								2,005 50		440 12	2,445 62
1880										1,114 29	1,114 29
1881											
1882										230 80	230 80
1883										362 75	362 75
1884										103 03	103 03
1885										497 89	497 89
1886											
1887										665 00	665 00
1888										2,250 00	2,250 00
1889											
1890											
1891										550 00	550 00
1892											
1893											
1894											
1895										5,688 39	5,688 39
1896										3,704 82	3,704 82
1897											
1898											
1899											
1900											
1901											
1902											
1903											
1904											
1905											
1906											
1907											
1908											
1909											
1910											
Total	$3,885,000 00	$15,106 55	$56,379 82	$3,843,726 73	$555,000 00	$6,287,815 52	$2,710,770 59	$859,612 30	$189,949 61	$159,212 08	$14,606,086 83
Deficiencies paid by General Fund and Erie and Champlain canals											3,196,778 47
											$17,802,865 30

GENESEE VALLEY CANAL.

YEAR.	DEFICIENCIES.		PAID.								
	Paid by the General Fund.	Paid by the Erie and Champlain canals.	Principal of loans.	Temporary loans.	Interest on loans.	Surplus tolls to Erie and Champlain canals.	Canal Commissioners and Superintendent of Public Works.	Superintendent of repairs.	Collectors.	Miscellaneous.	Total.
1837					$147 06		$22,371 86				$22,518 92
1838					100,000 00		229,161 20				329,161 20
1839	$43,339 85				100,000 00		764,182 61			$1,340 00	865,522 61
1840	78,852 44				102,602 74		1,151,653 97	$2,176 00		7,396 19	1,263,828 90
1841		$123,370 26		$100,000 00	126,062 76		612,760 50	12,750 91	$924 73	188 55	852,687 45
1842		178,773 56		455,000 00	171,478 22		520,409 56	18,062 75	1,308 56	912 18	1,167,171 27
1843		190,509 96			188,982 85		170,667 75	13,669 85	1,591 78	1,846 17	376,758 40
1844		196,794 74			198,120 75		202,106 67	15,719 96	1,540 55	1,197 61	418,685 54
1845		201,874 59			205,201 27		35,311 25	15,776 49	1,381 00	26,428 16	284,098 17
1846		204,022 19			209,126 59		39,328 58	17,614 20	1,464 00	740 15	268,273 52
1847					213,129 97	$7,766 87	10,441 67	15,782 32	1,506 01	1,414 17	250,041 01
1848		2,520 46			213,129 97		33,035 89	26,987 41	1,545 55	9,534 91	284,233 73
1849			$800,376 62		199,123 38	6,442 78	184,768 71	17,244 51	1,546 75	35,016 76	1,244,519 51
1850					157,103 61	10,084 83	375,164 73	17,350 00	1,387 15	162 67	561,252 99
1851		11,249 23			157,103 61		229,380 52	34,478 74	2,221 85	691 36	423,876 08
1852		51,318 27			157,103 61		208,930 94	73,290 05	3,092 61	146 35	442,563 56
1853		31,909 56			157,103 61		182,546 38	59,291 41	2,801 88	7,419 97	409,163 25
1854		19,220 95			157,103 61		98,989 79	44,759 69	3,123 34	1,684 04	305,610 47
1855		25,904 64			157,103 61		123,680 58	51,417 00	2,877 76	1,370 96	336,449 91
1856		12,039 69			157,103 61		123,820 60	22,192 85	3,367 25	11,033 18	317,517 49
1857		38,545 56			157,103 61		69,879 20	41,032 14	3,891 52	47,540 59	319,447 06
1858		61,589 35	542,832 82		150,148 86		74,256 35	49,136 90	4,634 71	46,189 54	867,199 18
1859		26,308 33	13,547 00		129,284 61		59,856 73	33,372 43	3,691 25	18,455 80	258,207 84
1860		20,129 95	196,243 56		126,340 96		78,949 86	12,261 70	4,488 08	30,041 18	448,325 34
1861		6,459 82	1,950,000 00		42,510 00		15,164 32	1,707 64	2,982 93	27,238 17	2,039,003 06
1862		41,782 77	264,000 00		13,493 33		46,413 77	16,261 06	2,609 70	51,277 65	394,055 51
1863		31,375 63	17,000 00		5,460 00		16,989 48	3,413 06	2,664 77	53,831 21	99,358 52
1864		125,056 73	91,000 00		4,095 00		17,702 09	18,499 68	2,762 76	129,945 38	264,004 91
1865		238,732 82					49,062 48	97,346 75	2,278 73	159,027 27	308,715 23
1866		93,110 58					80,875 68	14,822 51	3,576 53	92,475 42	191,750 14
1867		66,772 10					67,930 07	15,399 26	3,548 26	70,249 30	157,126 89
1868		74,908 54					46,210 22		3,332 14	74,260 97	123,803 33
1869		100,122 00	10,000 00				209,474 21	13,806 27	3,450 94	51,661 95	288,393 37
1870		138,990 59					250,491 55	109,239 54	3,932 35	30,446 80	394,113 21
1871		201,587 93					124,872 44	202,127 71	3,639 20	11,454 58	342,083 93

1872	....	190,347 79	....	....	....	....	23,582 95	176,173 17	3,565 76	26,291 42	229,613 30
1873	....	84,691 49	....	....	....	....	68,957 84	106,887 12	3,613 44	6,836 91	186,295 31
1874	....	90,927 30	....	....	....	....	50,384 64	102,694 12	3,242 75	5,072 89	161,394 40
1875	....	87,785 00	....	....	....	....	27,757 97	93,529 33	2,349 93	1,594 17	125,231 40
1876	....	8,595 60	....	....	....	....	11,612 03	17,647 20	1,341 76	625 04	31,226 03
1877	....	50,515 18	....	....	....	....	4,004 78	63,370 49	1,126 97	1,171 26	74,673 50
1878	....	21,144 79	....	....	....	....	1,124 37	28,974 65	1,000 01	....	31,099 03
1879	....	4,352 32	....	....	....	....	4,408 62	2,178 00	180 54	30 78	6,797 94
1880	....	17,347 88	....	....	....	....	9,328 83	8,994 44	138 90	....	18,462 17
1881	....	3,342 56	....	....	....	....	....	3,342 56	....	....	3,342 56
1882	....	556 47	....	....	....	....	419 80	333 32	....	4 15	787 27
1883	....	....	....	....	....	....	345 00	....	....	17 75	362 75
1884	....	....	....	....	....	....	100 00	....	....	3 03	103 03
1885	....	....	....	....	....	....	485 00	....	....	12 89	497 89
1886	....	....	....	....	....	....	....	....	....	....	....
1887	....	....	....	....	....	....	665 00	....	....	....	665 00
1888	....	....	....	....	....	....	2,250 00	....	....	....	2,250 00
1889	....	....	....	....	....	....	....	....	....	....	....
1890	....	....	....	....	....	....	....	....	....	....	....
1891	....	....	....	....	....	....	550 00	....	....	....	550 00
1892	....	....	....	....	....	....	....	....	....	....	....
1893	....	....	....	....	....	....	....	....	....	....	....
1894	....	....	....	....	....	....	....	....	....	....	....
1895	....	....	....	....	....	....	5,688 39	....	....	....	5,688 39
1896	....	....	....	....	....	....	3,645 80	....	....	59 02	3,704 82
1897	....	....	....	....	....	....	....	....	....	....	....
1898	....	....	....	....	....	....	....	....	....	....	....
1899	....	....	....	....	....	....	....	....	....	....	....
1900	....	....	....	....	....	....	....	....	....	....	....
1901	....	....	....	....	....	....	....	....	....	....	....
1902	....	....	....	....	....	....	....	....	....	....	....
1903	....	....	....	....	....	....	....	....	....	....	....
1904	....	....	....	....	....	....	....	....	....	....	....
1905	....	....	....	....	....	....	....	....	....	....	....
1906	....	....	....	....	....	....	....	....	....	....	....
1907	....	....	....	....	....	....	....	....	....	....	....
1908	....	....	....	....	....	....	....	....	....	....	....
1909	....	....	....	....	....	....	....	....	....	....	....
1910	....	....	....	....	....	....	....	....	....	....	....
Total	$122,192 29	$3,074,587 81	$3,885,000 00	$555,000 00	$3,755,267 20	$24,294 48	$6,742,136 23	$1,696,115 19	$100,724 70	$1,044,328 50	$17,802,866 30

STATEMENT of Receipts and Payments on Account of the Crooked Lake Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	Loans.	Premium on loans.	RECEIVED.					DEFICIENCIES.	
			Avails of loans.	From Sinking Fund.	Tolls.	Miscellaneous.	Total.	Paid by the General Fund.	Paid by the Erie and Champlain canals.
1831*	$100,000 00		$100,000 00				$100,000 00		
1832									
1833	20,000 00	$20,402 26	40,402 26			$5,997 24	46,399 50		
1834					$1,007 60		1,007 60	$12,829 82	
1835					1,803 76		1,803 76	8,243 35	
1836					1,953 90		1,953 90	9,794 28	
1837					1,547 61		1,547 61	10,323 54	
1838					1,566 06		1,566 06	11,037 55	
1839					1,893 90		1,893 90	7,769 52	
1840					1,613 16		1,613 16	9,819 72	
1841					2,023 46		2,023 46		$14,429 46
1842					1,216 73		1,216 73		13,718 06
1843					1,341 60		1,341 60		9,213 34
1844					1,367 21		1,367 21		9,380 69
1845					1,662 84		1,662 84		10,048 11
1846					1,846 37		1,846 37		36,771 78
1847				$6,000 00	1,774 55		7,774 55		51,797 10
1848				6,000 00	1,858 04		7,858 04		65,076 49
1849				6,000 00	1,819 17	75 00	7,894 17		11,341 26
1850				125,001 01	1,796 17	870 00	127,666 18		13,225 84
1851					1,714 34	15 00	1,729 34		11,773 68
1852					1,246 02	1,750 92	2,996 94		7,654 52
1853					1,656 75	4,700 00	6,356 75		4,651 75
1854					1,303 69		1,303 69		4,740 43
1855					837 48		837 48		5,371 36
1856					1,154 48		1,154 48		4,447 78
1857					879 26		879 26		11,812 65
1858					520 82		520 82		10,409 09
1859					715 06		715 06		4,935 49
1860					683 34		683 34		5,616 78
1861					699 94		699 94		6,384 27
1862					712 70		712 70		7,369 21
1863					746 40	2,126 82	2,873 22		5,130 76

1864	...	...	...	...	585 88	3,367 62	3,953 50	...	33,436 02
1865	...	...	...	...	290 65	6,171 94	6,462 59	...	36,798 20
1866	...	...	...	...	534 96	4,825 00	5,359 96	...	7,369 16
1867	...	...	...	...	672 93	...	672 93	...	7,624 69
1868	...	...	...	...	359 91	21,991 97	22,351 88	...	7,830 73
1869	...	...	...	...	338 81	42,667 85	43,006 66	...	8,262 96
1870	...	...	...	...	401 74	950 80	1,352 54	...	7,109 29
1871	...	...	...	...	301 47	4,800 00	5,101 47	...	73,532 07
1872	...	...	...	...	270 24	...	270 24	...	13,435 01
1873	...	...	...	...	228 61	3,735 31	3,963 92	...	7,096 97
1874	...	...	...	...	248 53	...	248 53	...	12,519 94
1875	...	...	...	...	126 09	1 70	127 79	...	7,582 36
1876	...	...	...	...	30 48	...	30 48	...	1,562 41
1877	...	...	...	...	...	36 00	36 00	...	...
1878	...	...	...	...	...	100 00	100 00	...	616 36
1879	...	...	...	...	...	2,070 00	2,070 00	...	...
1880	...	...	...	...	...	...	...	...	...
1881	...	...	...	...	...	...	...	...	156 81
1882 to 1910	...	...	...	...	...	...	...	...	...
Total	$120,000 00	$20,402 26	$140,402 26	$143,000 01	$45,352 71	$106,253 17	$435,008 15	$69,817 78	$550,232 88
Deficiencies paid by General Fund and Erie and Champlain canals							620,050 66		
							$1,055,058 81		

* Nine months.

CROOKED LAKE CANAL.

YEAR.	PAID.						
	Principal of loans.	Interest on loans.	Canal Commissioners and Superintendent of Public Works.	Superintendent of repairs.	Collectors.	Miscellaneous.	Total.
1831*	....	$1,537 67	$11,350 00	....	....	....	$12,887 67
1832	....	5,000 00	62,906 46	....	....	....	67,906 46
1833	....	5,250 00	52,461 30	....	....	....	57,711 30
1834	....	6,000 00	13,293 82	$2,437 67	....	....	21,731 49
1835	....	6,000 00	1 70	3,694 66	$350 75	....	10,047 11
1836	....	6,000 00	255 90	5,063 22	425 25	$3 21	11,748 18
1837	....	6,000 00	402 31	5,743 71	725 13	....	12,871 15
1838	....	6,000 00	....	5,060 07	543 54	....	11,603 61
1839	....	6,000 00	....	2,778 31	885 11	....	9,663 42
1840	....	6,000 00	....	4,559 23	873 65	....	11,432 88
1841	....	6,000 00	2 00	9,463 07	987 85	....	16,452 92
1842	....	6,000 00	....	8,016 66	918 13	....	14,934 79
1843	....	6,000 00	....	3,674 16	880 78	....	10,554 94
1844	....	6,000 00	....	3,905 84	842 06	....	10,747 90
1845	....	6,000 00	9 00	4,844 67	857 28	....	11,710 95
1846	....	6,000 00	26,358 42	5,384 00	875 73	....	38,618 15
1847	....	6,000 00	46,630 76	6,065 89	875 00	....	59,571 65
1848	....	6,000 00	57,493 78	8,558 88	881 87	....	72,934 53
1849	....	6,000 00	2,163 61	10,208 40	863 42	....	19,235 43
1850	$120,000 00	5,000 01	10,131 25	4,983 72	777 04	....	140,892 02
1851	....	....	6,429 28	6,118 94	954 80	....	13,503 02
1852	....	....	1,750 92	7,975 12	925 42	....	10,651 46
1853	....	....	....	5,350 00	958 50	....	6,308 50
1854	....	....	1,719 65	5,122 08	922 04	....	7,763 77
1855	....	....	2,565 20	5,320 39	888 45	....	8,774 04
1856	....	....	780 00	694 16	888 02	3,240 08	5,602 26
1857	....	....	7,340 70	199 98	703 86	4,447 37	12,691 91
1858	....	....	584 20	....	542 25	9,803 46	10,929 91
1859	....	....	147 78	....	440 09	5,062 68	5,650 55
1860	....	....	467 24	125 00	670 34	5,037 54	6,300 12
1861	....	....	573 10	....	493 98	6,017 13	7,084 21
1862	....	....	284 90	2,468 94	635 69	4,692 38	8,081 91
1863	....	....	2,306 66	....	555 56	5,141 76	8,003 98
1864	....	....	13,446 85	....	579 27	23,363 40	37,389 52
1865	....	....	6,432 68	....	627 53	36,200 58	43,260 79

1866	....	....	4,997 80	*273 00	687 63	7,185 84	13,144 27
1867	....	....	240 50	406 14	660 98	6,990 00	8,297 62
1868	....	....	22,373 82	....	592 79	7,216 00	30,182 61
1869	....	....	43,092 10	933 32	659 26	6,584 91	51,269 62
1870	....	....	....	599 99	741 26	7,120 58	8,461 83
1871	....	....	5,729 32	63,931 28	673 98	8,298 96	78,633 54
1872	....	....	858 58	3,328 09	670 66	8,847 92	13,705 25
1873	....	....	3,735 31	....	673 48	6,652 10	11,060 89
1874	....	....	....	7,829 74	676 27	4,262 46	12,768 47
1875	....	....	243 00	7,153 80	313 35	....	7,710 15
1876	....	....	....	1,592 89	....	....	1,592 89
1877	....	....	....	....	....	†36 00	36 00
1878	....	....	716 36	....	....	....	716 36
1879	....	....	....	....	....	2,070 00	2,070 00
1880	....	....	....	....	....	....	....
1881	....	....	150 00	....	....	6 81	156 81
1882 to 1910	....	....	....	....	....	....	....
Total	$120,000 00	$112,787 68	$410,426 26	$213,865 62	$29,698 05	$168,281 20	$1,055,058 81

* Nine months.

† Surplus to Erie and Champlain canals.

STATEMENT of Receipts and Payments on Account of Oneida Lake Canal, in Each Year, up to September 30, 1910, inclusive, viz.:

YEAR.	RECEIVED.					Deficiencies paid by Erie and Champlain canals.	PAID.							
	Loans.	From Sinking Fund.	Tolls.	Miscellaneous.	Total.		Principal of loans.	Purchase of canal and feeder.	Interest on loans.	Superintendents.	Collectors.	Surplus tolls to Erie and Champlain canals.	Canal Commissioners, Supt. of Public Works and Miscellaneous.	Total.
1841	$50,000 00		$294 58		$50,294 58	$3,319 82		$50,000 00	$1,166 09	$2,332 81	$115 50			$53,614 40
1842			471 85		471 85	7,857 41			2,500 00	5,554 15	275 11			8,329 26
1843			475 04		475 04	4,513 56			2,500 00	2,234 25	254 35			4,988 60
1844			683 67		683 67	3,786 19			2,500 00	1,619 86	350 00			4,469 86
1845			678 66		678 66	3,477 79			2,500 00	1,406 45	250 00			4,156 45
1846			604 41		604 41	20,295 19			2,500 00	18,149 50	250 10			20,899 60
1847		$2,500 00	487 49		2,987 49	5,875 78			2,500 00	6,130 02	233 25			8,863 27
1848		2,500 00	671 89		3,171 89	1,444 17			2,500 00	1,866 05	250 01			4,616 06
1849		2,500 00	794 67		3,294 67	1,447 80			2,500 00	1,992 58	249 98			4,742 56
1850		2,500 00	2,513 19	$15 88	5,029 07	2,731 98			2,500 00	4,719 29	528 88		$15 88	7,764 05
1851		45,250 00	6,178 57		51,428 57		$44,000 00		1,250 00	3,590 16	725 46	$1,862 95		51,428 57
1852		6,000 00	7,795 05		13,795 05		6,000 00			5,403 08	649 07	1,742 90		13,795 05
1853			10,282 18		10,282 18					5,761 92	822 13	3,698 13		10,282 18
1854			9,802 11		9,802 11	2,897 04				11,802 83	986 32			12,789 15
1855			7,340 81		7,340 81	171 83				6,235 63	1,057 01		220 00	7,512 64
1856			8,639 04		8,639 04					107 91	1,018 69	5,030 73	2,481 71	8,639 04
1857			4,849 34		4,849 34						863 39	46 09	3,939 86	4,849 34
1858			1,235 32		1,235 32	3,631 24					762 62		4,103 94	4,866 56
1859			701 41		701 41	5,024 46					600 87		5,125 00	5,725 87
1860			290 33		290 33	4,906 97					937 88		4,269 42	5,207 30
1861			218 86		218 86	4,842 41				400 00	755 51		3,905 76	5,061 27
1862			121 83		121 83	2,682 33				100 00	329 15		2,375 01	2,804 16
1863			45 21		45 21	3,102 23							3,147 44	3,147 44
1864			5 00		5 00	5,072 87							5,077 87	5,077 87
1865						7,792 21							7,792 21	7,792 21
1866						4,166 72							4,166 72	4,166 72
1867				7,089 76	7,089 76	68 92							7,158 68	7,158 68
1868				22,603 20	22,603 20								22,603 20	22,603 20
1869				90,196 80	90,196 80								90,196 80	90,196 80
1870				188,486 00	188,486 00								188,486 00	188,486 00

1871				56,965 15	56,965 15								56,965 15	56,965 15
1872				5,710 00	5,710 00								5,710 00	5,710 00
1873				500 00	500 00								500 00	500 00
1874				29,228 41	29,228 41								29,228 41	29,228 41
1875				21,348 55	21,348 55								21,348 55	21,348 55
1876				13,609 87	13,609 87								13,609 87	13,609 87
1877				22,291 97	22,291 97					15,775 17			6,516 80	22,291 97
1878			6 00	4,089 06	4,095 06	872 31				1,991 06			2,976 31	4,967 37
1879			1 96		1 96	3,919 09							3,921 05	3,921 05
1880						430 32							430 32	430 32
1881														
1882														
1883														
1884														
1885														
1886														
1887				359 75	359 75								359 75	359 75
1888				139 60	139 60								139 60	139 60
1889														
1890				1,001 55	1,001 55								1,001 55	1,001 55
1891				289 00	289 00								289 00	289 00
1892														
1893				18,285 79	18,285 79								18,285 79	18,285 79
1894				23,533 95	23,533 95								23,533 95	23,533 95
1895				370 40	370 40								370 40	370 40
1896				30 00	30 00								30 00	30 00
1897				1,997 29	1,997 29								1,997 29	1,997 29
1898														
1899														
1900														
1901														
1902														
1903														
1904														
1905														
1906														
1907														
1908														
1909														
1910														
Total	$50,000 00	$61,250 00	$65,188 47	$508,141 98	$684,580 45	$104,433 73	$50,000 00	$50,000 00	$24,916 09	$97,172 72	$12,265 28	$12,380 80	$542,279 29	$789 014 18
Deficiencies paid by Champlain and Erie canals					104,433 73									
					$789,014 18									

Statement of Receipts and Payments in Each Year on Account of all the State Canals up to September 30, 1910, Inclusive.

RECEIVED.

YEARS.	Loans.	Premiums on loans.	Discount on loans.	Avails of loans.	Avail of canal revenue certificate.	Temporary loans.	Tolls.	Tax	Various duty.	Salt duty.	Steamboat tax.	Sales of land.	Interest on deposits and investments.	Rent, of surplus water.	General fund for deficiencies.	E. and C. canals for B. R. canal and E. C. feeder.	Erie and Champlain canals for deficiencies.	Miscellaneous.	Total.
1817	$200,006 00			$200,066 00					$72,061 41	$2,926 28	$16,509 93								$261,497 62
1818	200,000 00	$9,040 00		209,040 00					145,943 02	48,784 27	18,902 70							$5,060 00	427,720 99
1819	400,000 00	7,885 00		407,885 00					111,319 04	54,410 69	16,412 44								566,027 17
1820	693,500 00	23,517 50		717,017 50					122,653 07	67,038 67	6,684 92							3,678 00	617,072 10
1821	1,400,000 00	50,760 00		1,450,760 00			$2,200 00		121,195 97	46,345 24	5,000 00								1,625,501 21
1822	1,350,000 00	47,827 75	$5,093 75	1,392,734 00			44,486 72		146,485 59	65,416 37	5,000 00								1,654,122 68
1823	1,656,000 00	1,609 50	59,895 00	1,597,714 50			119,988 08		181,814 36	102,221 04	5,000 00								2,066,738 58
1824	1,568,270 99	82,720 01		1,651,006 00			289,320 58		196,424 73	99,211 18									2,235,956 49
1825	270,000 00			270,000 00			521,343 94		253,452 38	71,222 75		$2,371 30							1,118,396 37
1826	377,000 00	9,000 00		386,060 00			844,508 02		203,737 84	83,272 59		30,182 19	$4,515 40						1,552,216 04
1827							880,454 09		265,290 65	126,030 58		30,950 60	9,487 96	$680 60					1,312,893 88
1828	210,000 00	2,805 00		212,805 00			829,535 10		221,686 40	118,423 89		79,748 59	17,057 30	1,467 00					1,481,623 28
1829	87,000 00			87,000 00			815,239 58		215,385 18	157,160 58		47,780 18	26,173 80	2,679 70				677 50	1,352,096 52
1830	150,000 00	15,694 00		165,694 00			1,042,699 24		179,681 02	163,421 55		34,420 43	39,600 17	2,464 18	$38,068 29			1,074 60	1,667,123 57
1831 (9 months)	240,263 00	21,179 71		261,442 71			748,561 29		155,901 66	98,703 91		11,870 75	46,256 20	2,707 33	21,440 74			13,366 58	1,360,245 17
1832							1,112,194 74		250,424 02	179,096 46		17,915 75	104,369 15	723 00	23,177 64			4,419 75	1,692,320 41
1833	95,737 00	32,663 81		128,400 81			1,388,055 53		181,014 23	227,860 05		3,445 26	140,319 90	325 00	63,205 54			16,387 95	2,149,104 27
1834	950,000 00	66,255 00		1,016,255 00			1,381,951 52		169,337 04	160,782 98		1,683 82	121,174 64	5,763 50	69,064 06			3,873 46	2,930,786 92
1835							1,482,963 11		211,037 24	118,364 92		2,897 45	157,499 54	1,632 60	44,405 30			50,164 80	2,069,024 95
1836	650,000 00	13,000 00		663,066 00			1,595,619 48		187,194 20	64,763 46		33,671 80	179,177 98	2,836 00	94,607 65			5,230 83	2,840,001 40
1837	810,920 22	21,374 62		832,294 84			1,324,429 27					11,116 05	181,580 02	1,180 50	217,385 69			410 05	2,568,366 32
1838	3,403,001 54	13,391 79		3,506,453 33			1,464,105 16					4,297 98	276,529 42	1,170 00	245,891 95			1,306 81	5,499,757 65
1839	1,545,000 00	500 00		1,545,600 00			1,653,007 56					4,360 00	230,323 55	2,776 00	226,027 95	$40,462 00		7,626 26	3,716,084 28
1840	3,478,553 90		125,975 00	3,352,578 90		$450,000 00	1,602,059 10						140,691 20	4,768 18	342,273 28	243,634 70	$1,250 00	6,016 05	6,143,871 41
1841	2,213,497 57		199,097 57	2,014,400 00		1,855,000 00	1,987,807 85						137,866 34	1,878 86			376,367 08	3,573 75	6,376,923 88
1842	3,411,618 00			3,411,018 00		38,967 00	1,795,484 80					131 00	105,459 83	1,979 00			405,070 05	4,416 21	5,853,135 79
1843	1,002,700 00	26,775 00		1,029,475 00			1,952,587 83						103,085 17	1,241 25			474,766 23	5,173 97	3,566,328 45
1844	655,000 00	8,388 50		663,388 50			2,386,277 34	$278,197 56					104,314 57	2,180 00			461,776 09	2,840 26	3,898,974 32
1845	245,000 00	897 00		245,897 00			2,374,007 56	2,366 02					147,794 13	1,525 87			471,310 37	21,934 74	3,264,841 69
1846	300,000 00	14,988 80		314,988 80			2,788,134 76	56,503 47					101,890 49	10,715 00			420,642 97	10,508 28	3,709,283 77
1847							3,460,975 92	119,410 30				3,675 00	92,148 51	2,734 34			65,403 00	3,245 74	3,747,592 81
1848	1,314,819 34	31,720 16		1,346,539 60			3,153,614 24						75,123 83	3,354 14			88,062 07	7,667 17	4,674,366 95
1849	1,889,024 76	221,017 70		2,110,042 62			3,377,784 27						91,030 49	1,135 91			74,503 52	360,524 71	6,645,111 42
1850	192,585 40	10,829 87		203,415 36			3,390,476 63						110,189 64	2,604 74			142,497 72	7,690 30	3,856,874 39
1851	1,000,000 00	9,756 75			$1,009,756 75		3,702,070 34						30,130 07	1,929 00			95,601 55	17,457 07	4,857,005 38
1852	700,000 00	21,519 00		218,885 00	502,634 00		3,173,222 49						47,626 81	1,635 00			107,255 68	36,365 34	4,147,564 32
1853							3,161,425 14						58,678 11	765 00			202,450 32	37,122 67	3,466,347 14
1854	2,250,000 00	342,952 77		2,592,952 77			2,980,139 97	657,145 86					42,699 83	1,975 00			211,278 98	30,144 25	6,516,330 66
1855	3,750,000 00	625,285 05		4,375,285 05			2,631,491 11						117,343 40	1,415 00			130,382 11	56,394 66	7,366,310 79
1856	6,750,000 00	407,201 70		7,157,261 70			2,719,925 63	320,000 00					136,358 45	1,815 00			38,836 41	64,837 34	10,438,977 53
1857	2,750,000 00	323,727 50		3,073,727 50			2,529,865 88	262,500 00					149,953 23	1,938 50			168,643 73	56,471 45	6,233,160 29
1858	2,200,000 00	57,150 50		2,257,150 50		300,000 00	2,045,442 68	1,240,500 00					107,882 32	1,948 33			343,231 40	160,195 76	6,465,350 96
1859						207,500 00	1,812,280 80	890,567 66					49,462 37	2,081 67			116,538 34	173,090 08	3,251,126 92
1860	3,960,000 00	146,329 00		4,046,329 00		355,000 00	2,379,534 04	1,069,515 70					48,410 49	1,767 24			125,169 27	130,672 36	8,156,398 13
1861	1,200,000 00	16,883 50		1,216,883 50			3,353,168 97	840,552 28					67,470 77	4,865 00			127,122 13	122,307 40	5,732,370 05
1862							4,790,518 09	2,769,623 09					122,941 98	6,765 00			178,677 20	103,646 21	7,972,071 57
1863							5,028,431 32	1,420,188 45					154,959 84	1,166 00			146,865 87	117,523 84	6,869,131 32
1864							4,308,781 20	535,373 94					160,329 37	1,511 82			278,603 73	55,179 61	5,340,079 97
1865							3,516,948 63	881,770 20					200,710 84	4,683 00			734,673 88	178,843 50	5,517,039 14
1866							4,248,931 17	2,147,613 92					166,106 06	4,293 75			290,566 82	137,347 96	7,063,862 71
1867							3,992,161 29	1,406,817 23					143,779 03	1,165 00			297,324 51	137,406 47	6,678,653 63
1868							4,417,559 50	1,019,265 98					129,170 47	750 00			286,069 00	114,480 10	5,066,295 80
1869							4,112,878 52	1,828,400 39					155,358 73	1,215 00			230,734 91	22,133 66	6,360,720 61
1870							3,080,893 57	1,595,053 56					161,527 70	2,129 48			608,228 03	13,032 78	5,351,765 12
1871						200,000 00	2,813,686 29	3,880,035 93					52,488 87	1,207 50			688,295 23	9,388 81	7,645,162 63
1872	1,562,900 00	9,789 80		1,572,689 86			3,060,328 89	2,238,695 69					18,837 19	2,705 00			577,181 58	74,686 11	7,644,818 32
1873	3,145,500 00			3,145,500 00			3,021,603 67	2,863,069 57					88,087 89	5,965 00			231,440 16	244,881 80	9,600,657 68
1874	2,040,600 00			2,004,600 00			2,921,721 74	3,279,985 15					70,737 64	1,670 08			287,706 77	65,605 74	8,662,035 42
1875	2,000,000 00	60,000 00		2,060,000 00			1,902,990 64	2,537,819 04					79,086 32	1,865 00			264,979 83	20,526 41	6,857,266 24
1876	473,000 00	27,001 50		500,601 50			1,477,331 55	712,819 96					130,572 82	945 00			87,672 27	20,560 33	2,930,443 43
1877							1,041,690 66						131,974 73	7,537 40			161,835 94	26,461 64	1,302,566 36
1878							982,243 06	900,208 50					101,524 38	2,741 56			87,778 79	20,867 98	2,104,364 27
1879							907,479 95	805,083 31					93,614 94	2,160 38			82,814 61	28,689 43	1,020,142 62
1880							1,183,352 74	789,724 90					96,209 70	2,177 08			103,652 17	5,299 77	2,180,316 36
1881							810,532 05	878,938 03					113,000 13	1,535 00			117,264 34	19,232 52	1,941,162 07
1882							647,602 88	788,289 74					106,857 06	1,010 85			62.619 38	14,151 82	1,021,431 73
1883							271,706 49	1,145,763 75					101,145 21	2,548 66			80,004 22	20,788 67	1,622,857 29
1884								2,947,108 35					99,153 50	770 00				23,657 27	3,070,689 12
1885								1,683,950 74					203,188 75	1,130 00				11,366 44	1,899,635 93
1886								1,668,060 26					176,433 46	1,385 00				4,169 17	1,850,037 89
1887								2,148,928 31					362,153 94	1,657 50				13,184 05	2,626,923 80
1888								2,305,733 93					267,660 70	1,380 00				6,778 05	2,681,552 68
1889								2,209,880 37					139,666 05	1,615 00				16,302 82	2,367,424 24
1890								2,127,000 00					233,213 50	780 00				30,567 30	2,361,690 92
1891								2,314,600 06					241,103 61	950 00				16,003 14	2,571,746 81
1892								1,554,488 00					82,949 32	1,650 00				7,300 17	1,646,387 49
1893								1,162,734 94					20,632 63	500 00				6,689 27	1,189,456 84
1894								1,100,000 00					16,772 88	900 00				3,980 42	1,121,653 30
1895						100,000 00		990,582 16					7,960 86	500 00				5,070 66	1,105,013 58
1896	1,770,000 00	1,378 00		1,771,378 00				2,095,559 54					19,978 65	1,987 03				7,380 62	3,890,283 74
1897	4,000,000 00	39,839 52		4,039,839 52				2,571,169 47					95,421 33	750 00				4,975 51	6,712,155 83
1898	3,230,000 00	163,761 00		3,393,761 00				2,120,086 08					96,324 74	2,322 50				3,340 25	5,615,834 57
1899								1,600,000 00					61,464 26	750 00				25,813 84	1,688,028 10
1900								2,638,489 40					78,892 75	1,150 00				7,192 40	2,725,724 55
1901								2,839,877 43					74,414 94	1,406 25				7,541 49	2,923,330 11
1902								2,559,114 75				546 36	91,087 17	1,560 00				23,727 81	2,676,026 09
1903								748,072 05					109,481 65	1,165 00	1,712,848 32			4,232 00	2,575,799 02
1904						335,179 32		761,085 02				14,550 00	129,700 65	1,000 00	1,686,039 00			7,494 98	2,935,048 89
1905	2,000,000 00	46,260 00		2,046,260 00		176,871 63		968,041 09				631 88	174,111 25	500 00	1,507,981 50			40,610 90	4,915,009 06
1906	1,000,000 00	11,300 00		1,011,300 00				1,191,677 51				1,172 25	189,084 39	10,224 46	1,413,085 47			9,990 79	3,827,134 87
1907	5,000,000 00			5,000,000 00				5,089,582 61				3,526 44	257,141 46	11,577 27	1,244,533 02			129,165 77	11,735,526 57
1908	4,990,000 00	13,945 90		5,003,945 90				5,439,015 92					508,525 62	970 00	1,190,702 00			5,211 32	12,148,370 76
1909	10,010,000 00	113,900 00		10,123,900 00				5,825,214 56					638,683 69	770 00	1,300,708 80			21,749 10	17,911,026 15
1910	11,000,000 00	77,462 60		11,077,462 60		1,520,000 00		1,043,940 82					894,603 01	770 00	1,291,998 42			170,111 93	15,998,886 78
Total	$107,735,551 81	$3,249,893 93	$390,061 32	$109,082,993 67	$1,512,390 75	$5,538,517 95	$134,837,814 26	$99,865,202 36	$3,592,039 05	$2,055,458 06	$73,509 99	$340,945 08	$11,439,861 08	$191,572 39	$12,734,995 41	$290,097 60	$10,567,263 84	$3,572,808 74	$395,695,410 29

Statement of Receipts and Payments in Each Year on Account of all the State Canals up to September 30, 1910, Inclusive.

PAID.

YEARS.	Principal of loan.	Premiums and accrued interest on purchase and investment of stock.	Temporary loans.	Interest on loans.	Canal Commissioners and Superintendent of Public Works.	Seneca Lock Navigation Company.	Black River canal for Erie canal feeder.	General fund.	General fund debt.	Deficiencies of lateral canals and Oneida river improvements.	Purchase of Oneida Lake canal and feeder.	REPAIRS OF CANALS.		Expenses of collectors and inspectors.	Weighmasters.	Miscellaneous.	Total.
												Contractors.	Superintendents.				
1817				$6,000 00	$200,000 00											$200 00	$206,200 00
1818				16,250 00	466,900 00											158 37	483,308 37
1819				38,836 64	587,467 09											107 37	620,471 10
1820				70,927 27	668,900 00											152,051 38	892,778 65
1821				123,672 55	1,120,500 00											2,707 95	1,246,880 50
1822				190,948 50	1,955,012 23											1,787 50	2,147,748 23
1823				209,297 13	1,784,102 61											484 80	1,993,884 54
1824				442,041 40	1,275,543 82											104 44	1,717,779 66
1825				409,884 24	990,537 84											10,121 02	1,410,543 70
1826	$270,000 00			423,951 20	648,365 95	$34,095 83							$124,652 51	$255 83		3,511 48	1,504,832 80
1827	94,615 00			418,125 49	374,065 37	19,776 05							284,654 16	26,030 01	$450 00	20,408 61	1,247,731 29
1828	20,000 00	$1,000 00		424,010 15	267,003 92								224,227 25	27,042 33	4,052 87	45,884 62	1,013,221 14
1829	321,142 99	12,800 00		418,842 19	112,801 70								255,729 55	27,054 41	5,110 03	20,988 72	1,174,476 19
1830	30,977 14			416,520 99	97,641 36								229,850 50	24,991 03	4,377 88	15,198 38	810,357 44
1831 (nine months)	9,653 00			318,564 74	171,019 25								158,715 53	25,002 63	2,023 50	10,040 49	712,279 14
1832				432,217 32	171,307 74								350,426 89	25,760 85	4,430 59	15,355 54	099,409 03
1833	1,478,376 57	87,933 46		411,196 34	144,741 99								377,783 40	27,875 08	4,002 25	42,271 93	2,574,781 02
1834	588,006 61	50,823 45		358,810 52	241,662 34								471,106 00	28,810 14	4,511 25	13,108 45	1,750,845 66
1835	706,943 49	75,217 09		365,823 40	703,902 28								441,367 54	30,610 07	4,781 30	13,450 72	2,342,101 89
1836	651,249 46	40,529 14		328,744 86	977,550 82								302,444 22	31,004 42	4,211 20	20,576 00	2,452,370 72
1837	971,644 93	55,268 01		309,108 82	1,206,663 63								486,412 41	35,804 98	5,071 71	19,187 47	3,089,761 00
1838	351,023 15	13,988 02		446,798 88	1,640,070 19								476,095 22	30,110 02	0,350 32	24,340 04	2,989,689 04
1839	67,300 33			494,817 34	3,655,460 09½		$46,462 96						381,903 15	47,262 00	0,067 85	20,355 41½	4,725,629 14
1840	137,726 22	413 69		658,921 58	5,005,515 75		243,634 70			$1,250 00			389,247 94	47,972 05	5,710 28	112,018 03	6,602,420 14
1841	33,770 85		$450,000 00	801,683 57	3,647,214 53			$1,837,602 73		376,397 08	$50,000 00		380,305 50	47,050 80	5,200 22	41,100 30	7,671,450 70
1842	143,600 03	187 50	1,855,000 00	1,006,497 81	2,599,116 81			200,000 00		495,079 95			432,105 71	47,210 12	5,152 55	46,880 17	0,830,830 05
1843	184,768 27		20,000 00	1,093,474 98	797,230 84					474,765 23			378,018 45	42,558 21	4,500 84	00,714 03	3,056,637 45
1844	333,418 60	16,810 40	18,967 00	1,116,726 53	712,499 93			100,000 00		461,776 09			444,344 98	41,535 84	4,724 21	74,034 59	3,325,388 17
1845	1,268,884 81	2,577 94		1,104,319 98	333,717 68					471,316 37			520,001 30	42,438 00	4,985 00	60,716 32	3,814,958 00
1846	2,691,780 64			976,552 48	182,367 30			400,000 00		426,542 97			509,510 96	44,510 21	4,705 03	77,584 47	5,583,650 90
1847	284,490 56	5,131 40		937,205 64	162,276 57			200,000 00	$471,916 66	65,403 00			493,157 10	45,602 00	6,060 05	42,648 03	2,712,988 57
1848	1,344,919 00	3,829 25		911,736 05	864,767 36			200,000 00	350,000 00	88,062 07			587,792 91	51,882 00	5,885 71	73,209 04	4,582,084 89
1849	2,097,329 00			898,599 05	1,513,862 71			200,000 00	350,000 00	74,593 52			528,371 38	50,527 82	0,178 80	82,606 14	5,802,128 42
1850	482,786 64			868,873 74	2,132,379 93			200,000 00	350,000 00	142,497 72			560,846 02	48,904 57	0,081 03	245,815 69	5,038,185 84
1851	573,609 91			835,064 66	1,444,706 71			200,000 00	350,000 00	95,661 55			582,598 82	67,945 95	7,412 50	61,800 08	4,318,801 08
1852	340,265 45			843,795 62	1,381,254 63			200,000 00	350,000 00	167,255 68			809,451 99	02,467 38	7,070 03	78,304 70	4,239,932 38
1853				960,790 28	1,022,005 84			200,000 00	350,000 00	202,456 32			778,847 57	02,992 31	7,408 11	00,902 98	3,645,553 41
1854	479,025 00			926,231 51	1,156,024 74			200,000 00	350,000 00	211,278 98			059,398 43	07,600 77	7,873 10	72,371 22	4,439,872 81
1855	2,240,911 00			1,076,573 17	2,938,707 23				350,000 00	130,382 11		$10,873 23	788,781 41	71,753 20	8,003 20	55,587 11	7,077,661 75
1856	4,489,266 34			1,194,306 67	4,011,241 22				350,000 00	38,839 41		98,393 82	608,538 56	74,827 15	7,790 73	81,283 22	10,854,493 12
1857	102,285 00	267 95		1,361,736 93	2,941,936 58				262,500 00	158,643 73		141,063 69	020,070 30	75,207 84	7,779 10	150,158 04	5,828,618 16
1858	2,929,767 34		100,000 00	1,406,120 80	1,942,658 43					343,231 40		150,464 70	740,477 21	80,279 28	8,006 78	118,033 32	7,819,129 20
1859	152,170 00		200,000 00	1,358,892 32	856,159 49					115,538 34		163,668 59	465,911 02	63,287 00	0,205 93	177,039 55	3,559,863 14
1860	1,100,523 00		562,500 00	1,472,745 78	3,264,976 23					125,160 27		229,127 67	149,158 22	87,021 37	0,807 07	00,304 70	7,100,484 00
1861	2,175,551 23			1,505,304 64	1,188,758 07					127,122 13		260,995 33	106,611 51	52,345 55	8,111 30	07,906 80	5,502,766 56
1862	2,120,000 00	22 49		1,429,859 36	1,264,078 51				350,000 00	178,577 20		296,168 98	131,910 64	58,023 35	8,430 85	150,308 01	5,087,388 99
1863	733,300 00	62,271 08		1,381,995 76	545,623 28			200,000 00	350,000 00	146,865 87		353,993 02	100,977 07	50,774 51	0,104 07	535,855 38	4,542,820 94
1864	836,700 00	36,428 28		1,321,440 26	947,618 83			200,000 00	350,000 00	278,903 73		498,938 41	313,874 55	59,320 20	0,250 88	235,054 47	5,088,135 70
1865	2,844,374 76	21,517 83		1,176,289 39	1,019,611 50			151,113 40	950,000 00	734,673 88		950,033 01	700,182 87	67,410 85	9,705 70	137,301 29	8,762,220 48
1866	1,348,935 49	1,412 84		1,081,875 38	1,253,784 14				782,961 04	299,569 82		685,446 80	374,128 51	74,584 30	11,300 35	128,204 06	0,642,208 73
1867	2,515,400 00	11,380 05		960,402 50	1,511,949 94				913,125 00	297,324 51		691,033 52	75,184 10	70,168 06	11,824 04	149,550 37	7,622,351 99
1868	1,483,100 00	7,609 31		869,761 25	1,098,223 94				350,000 00	285,069 69		775,118 74	291 02	76,751 11	13,347 70	149,026 26	5,108,309 02
1869	1,685,180 00	23,826 78		802,210 25	1,398,640 57			127,058 47	1,850,000 00	230,734 91		785,560 90	81,851 37	77,419 04	12,610 09	119,500 18	7,194,608 46
1870	598,200 00	32,036 00		724,752 00	2,864,018 16					508,228 03		838,091 13	508,171 58	90,190 47	14,200 02	285,274 55	6,463,267 84
1871				706,921 00	1,863,849 62				569,974 61	688,295 23		626,398 33	1,100,650 53	89,054 40	14,044 12	229,799 55	5,888,987 48
1872	2,132,800 00		200,000 00	673,052 50	1,846,370 98				981,588 68	577,181 58		510,116 48	945,694 12	85,181 02	12,285 30	297,083 39	8,261,654 05
1873	3,189,300 00			610,514 50	2,353,974 09				1,202,571 35	231,449 15		61,017 29	1,047,812 00	83,824 85	11,950 20	494,668 03	9,287,082 87
1874	3,127,050 00			593,819 09	2,416,850 62				1,500,000 00	287,705 77		14,162 46	1,161,859 00	84,833 44	12,846 39	512,830 37	9,711,963 14
1875	2,143,770 00			604,060 39	1,538,253 87			200,000 00		254,979 83		243 00	984,862 10	75,857 41	12,118 00	201,543 30	6,015,687 99
1876	478,000 00			603,960 00	701,116 67					87,672 27			830,677 02	73,371 15	10,883 22	108,570 00	2,084,256 33
1877	181,300 00	108,675 31		598,836 89	214,452 64					151,835 94			929,311 34	55,565 43	9,827 69	179,947 13	2,429,752 37
1878	880,000 00			549,646 11	235,231 97					87,778 79			521,381 53	50,705 00	4,108 76	150,475 50	2,479,327 56
1879	32,000 00	5,622 50		540,822 00	370,087 84					82,814 61			351,161 75	41,956 07	5,212 86	151,300 30	1,580,984 59
1880		10,450 00		538,902 00	324,772 10					103,552 17			436,180 12	46,207 02	5,642 87	122,941 02	1,588,707 30
1881	5,000 00	55,581 25		538,602 00	528,473 67					117,264 34			440,887 21	40,048 01	4,848 35	130,902 74	1,807,608 47
1882				538,602 00	186,219 66					62,619 38			361,906 04	35,337 23	2,880 83	135,273 42	1,322,847 56
1883	635,200 00	278,374 80		519,336 00	193,502 04					80,904 22			382,812 41	26,844 62	526 62	89,107 50	2,206,608 21
1884	9,000 00			500,310 00	330,864 74								407,885 36	24,472 87		71,447 19	1,343,980 16
1885		40,856 25		500,310 00	493,162 40								374,123 04	23,189 94		113,783 93	1,545,425 56
1886	34,650 00	97,289 07		500,250 00	355,339 37								400,972 16	24,214 38		73,086 54	1,485,801 52
1887	1,660,200 00	43,419 74		495,840 00	577,740 18								412,934 01	23,203 38		103,708 22	3,317,135 53
1888	501,650 00	116,834 75		372,997 50	887,108 38								413,605 44	23,207 37		122,543 27	2,438,046 71
1889	90,500 00	8,364 62		366,045 00	908,938 41								427,663 20	24,969 64		208,009 31	2,034,490 08
1890	1,710,550 00	102,988 76		325,402 50	1,034,225 07								492,465 87	26,878 01		127,037 05	3,819,547 26
1891	1,936,650 00	16,416 32		243,855 00	904,221 92								412,554 62	26,535 12		120,809 70	3,661,102 75
1892	1,941,800 00	70,536 13		76,722 00	564,978 60								433,902 79	20,828 06		94,261 19	3,209,089 07
1893	462,500 00	470 58		9,000 00	545,699 03								421,775 58	27,304 83		109,387 53	1,576,137 55
1894					847,844 29								430,246 30	27,437 24		136,683 40	1,451,211 23
1895			100,000 00		712,499 75								468,345 22	18,304 18		104,610 68	1,463,759 83
1896				15,675 00	890,294 30								487,770 57	18,006 14		411,170 38	1,822,916 39
1897	500,000 00			111,230 14	3,684,092 81								472,721 12	25,988 33		455,002 00	5,249,035 36
1898		19,074 32		206,550 00	5,876,353 36								480,191 04	24,553 17		471,992 11	7,078,714 60
1899		32,472 41		255,000 00	806,004 31								425,728 04	22,506 19		141,609 89	1,083,386 84
1900		49,737 65		255,000 00	1,269,234 81								504,679 03	23,206 87		321,789 11	2,423,647 47
1901		21,685 91		255,000 00	1,440,369 50								498,188 74	18,126 46		391,377 04	2,624,947 65
1902		5,392 58		255,000 00	992,051 42								498,632 67	21,676 93		270,338 69	2,043,092 29
1903		55,622 48		255,000 00	977,457 11								486,563 88	16,323 01		342,711 53	2,133,678 01
1904		270 37		255,000 00	968,465 27								484,197 39	16,805 67		528,324 63	2,253,063 33
1905		7,692 84	512,050 95	285,000 00	800,854 85								457,128 00	17,489 88		640,375 11	2,726,591 63
1906	1,270,000 00			292,500 00	1,425,798 91								*134,575 60	16,102 72		819,986 56	3,989,891 86
1907		32,309 19		320,400 00	2,434,964 64									15,941 96		939,743 01	3,743,448 80
1908		5,599 07		456,900 00	4,275,421 52									15,664 76		1,139,734 18	5,893,319 53
1909		341,322 57		756,900 00	8,012,508 41									14,900 60		†1,176,561 48	10,362,253 06
1910			1,520,000 00	906,900 00	8,758,934 94									14,120 69		1,980,558 02	13,180,513 65
Total	$66,504,891 81	$2,121,199 13	$5,538,517 95	$56,038,991 53	$135,012,682 62½	$53,871 88	$290,097 66	$5,015,774 60	$13,834,637 34	$10,567,263 84	$50,000 00	$8,147,809 10	$38,499,573 35	$3,079,686 39	$408,040 37	$18,710,319 67½	$364.473.363 25

There belongs to the Sinking Fund for the canal debt	$160 00
Sinking fund for the redemption of the debt for enlargement and completion of the canals	500 00
Sinking fund for redemption of debt for improvement of Erie, Champlain and Oswego canals (No. 1)	7,520,699 80
Sinking fund for redemption of debt for construction of Erie, Champlain and Oswego canals (No. 2)	905,454 45
Sinking fund for redemption of debt for construction of Erie, Champlain and Oswego canals (No. 3)	13,309,505 93
Sinking fund for redemption of debt for construction of Erie, Champlain and Oswego canals (No. 4)	90,946 25
Sinking fund for redemption of debt for construction of Cayuga and Seneca Barge Canal (No. 5)	7,637 57
Fund for extraordinary repairs	184,393 37
Fund for ordinary repairs	1,195,102 75
Fund for the construction of the Erie, Champlain and Oswego canals	7,054,555 72
Fund for construction of Cayuga and Seneca Barge Canal	973,517 05
Total	$31,242.472 89

Balance on hand September 30, 1910	31.222.047 04
Aggregate	$395,695.410 29
With the above balance of	$31,222.017 04
There are also unexpended balances in hands of canal officials	20.425 85
Total	$31,242.172 89

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* Subsequent to April 1, 1906, all salaries and expenses of superintendents of canal repairs have been paid by the Superintendent of Public Works, and such expenditures have been included in the column headed "Canal Commissioners and Superintendent of Public Works."

† Total miscellaneous payments were $1,577,668.90, but on account of there being a discount in the purchase of bonds of $401,107.42, this amount was deducted from miscellaneous.

FORTY-SECOND ANNUAL REPORT

OF THE

BOARD OF MANAGERS AND SUPERINTENDENT

OF THE

New York State School for the Blind

BATAVIA, N. Y.

FOR THE YEAR 1909-1910

TRANSMITTED TO THE LEGISLATURE JANUARY 18, 1911

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

STATE OF NEW YORK.

No. 13.

IN ASSEMBLY

January 18, 1911.

FORTY-SECOND ANNUAL REPORT

OF THE

BOARD OF MANAGERS AND SUPERINTENDENT OF THE NEW YORK STATE SCHOOL FOR THE BLIND, BATAVIA, N. Y.

MANAGERS' REPORT.

To His Excellency the Governor, and the Legislature of the State of New York:

We hereby transmit to you the forty-second annual report of the management of the New York State School for the Blind, at Batavia, N. Y.

Dr. F. PARK LEWIS, *Chairman.*
WILLIAM C. CASEY,
Mrs. H. A. HUMPHREY,
Committee.

BOARD OF TRUSTEES.

Name.	Address.	Term expires.
CORTLAND CROSMAN	Alexander	1911.
MRS. H. A. HUMPHREY	Warsaw	Feb. 1916.
F. W. SEVERNE	Watkins	April 1913.
F. PARK LEWIS, M. D.	Buffalo, 454 Franklin Street	1911.
GEORGE E. PERRIN	Batavia	April 1913.
WILLIAM C. CASEY	Batavia	Feb. 1915.
GEORGE F. WHEELOCK	Moscow	April 1911.

OFFICERS OF THE BOARD.

President	F. PARK LEWIS, M. D.
Secretary	GEORGE E. PERRIN.
Treasurer	WILLIAM C. CASEY.

Executive Committee.

CORTLAND CROSMAN, *Chairman.*
WILLIAM C. CASEY.
GEORGE E. PERRIN.

Industrial Committee.

F. W. SEVERNE, *Chairman.*
MRS. H. A. HUMPHREY.
GEORGE F. WHEELOCK.

Committee on Annual Report.

DR. F. PARK LEWIS, *Chairman.*
WM. C. CASEY.
MRS. H. A. HUMPHREY.

OFFICERS AND TEACHERS, 1909–1910.

Superintendent..............................CHAS. A. HAMILTON, M. A.
University of Rochester.

Literary Department.

RALPH W. ELDREDGE, A. B., Head Teacher...............High School.
Cornell University.

NITA FORD DUSTIN, B. L................................High School.
Smith College.

MARY E. SCARFF..........................Seventh and Eighth Grades.
Brockport State Normal and University of Chicago.

HARRIET A. LOUNSBURY................................Sixth Grade.
Cortland State Normal.

MARY A. DOOLEY..........................Fourth and Fifth Grades.
Solvay High School.

CORNELIA PHELAN.......................................Third Grade.
Lewiston High School.

CHARLOTTE H. WEED..................................Primary Grade.
Rochester Kindergarten Training Class.

LENA B. MILLER..Kindergarten.
Utica Kindergarten Training Class.

E. MAUDE HAZEN ....Typewriting.
Swanton High School and Albany Business College.

Department of Music.

JULIA S. LOOMIS.
Musical Director, and Instructor in Theory, Piano, Pipe Organ and Senior Choir.
Oberlin Conservatory of Music.

ELLEN S. CHITTENDEN.
Theory, Piano and Preparatory and Junior Choirs.
American Institute of Applied Music.

GRACE E. BARTLETT...Piano.
Ingham University.

AUGUST FRICKER...............Violin and Other Orchestral Instruments.
Pupil of G. Gilbert Caught, Henry Jacobson, Frank Davidson, Prof. Czerwinski and Prof. Marcosson.

FRANK S. HARRIS...................................Piano Tuning.
New England Conservatory of Music and Vose & Sons Factory.

Stereotyping Department.

JENNIE HINSDALE....................................Stereotyper.

Manual Training and Industrial Department.

MRS. HARRIET E. PIERSON	Teacher Knitting, Sewing and Weaving.
JOSEPH WEST,	Teacher Manual Training, Broom Making, Chair Caning and Mattress Making.

Department of Physical Education.

C. R. BEEMAN	Physical Instructor. Syracuse University.

Household Department.

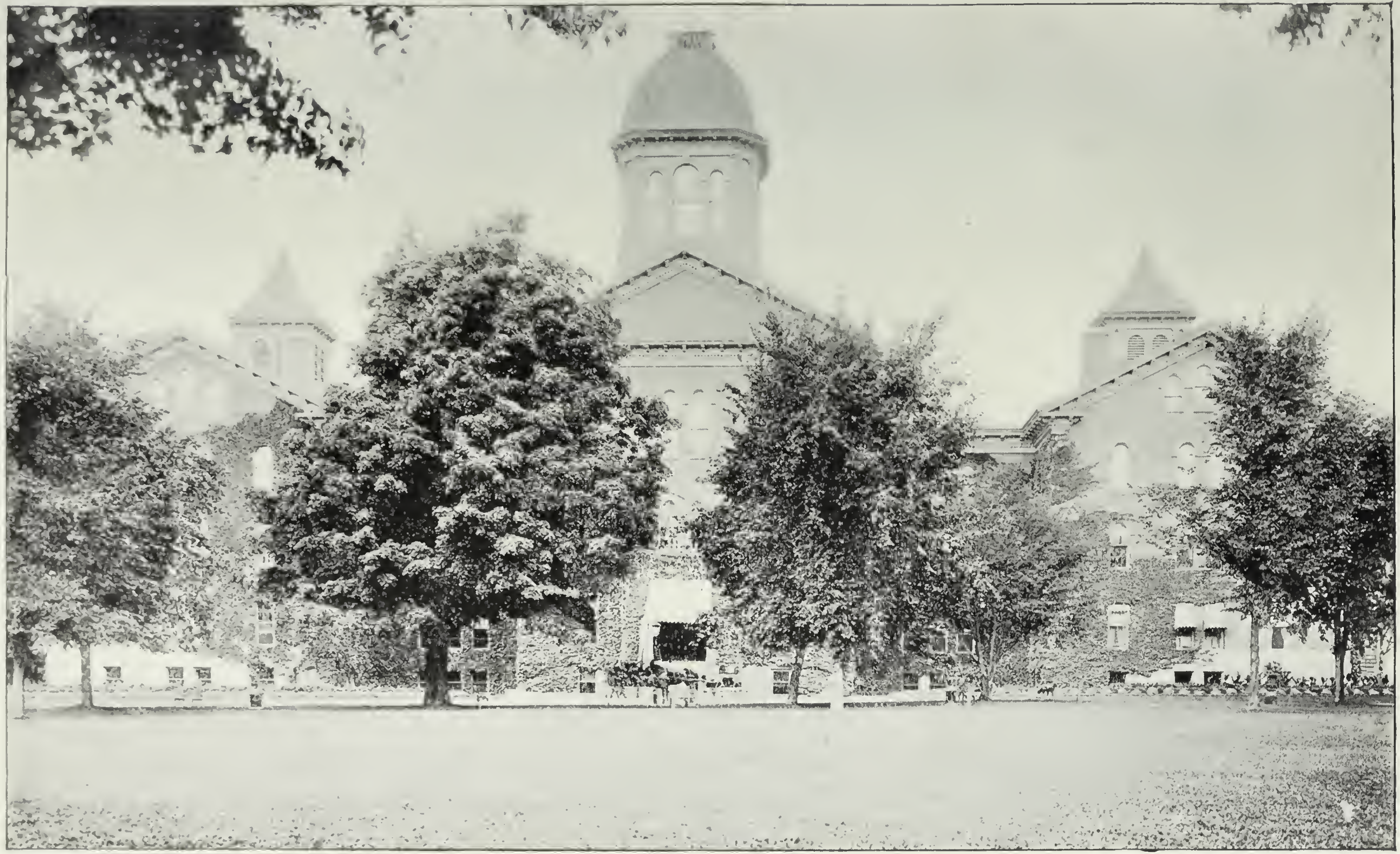
MINNIE J. GOULD	Matron.
JESSIE D. HINSDALE	Boys' Assistant Matron.
MARIAN S. HUMPHREY	Girls' Assistant Matron.
CLARE SIMPKINS	Assistant Matron.
CLARA M. SHEFFIELD	Housekeeper.
LORENZO BURROWS, Jr	Ophthalmic Examiner.
J. W. Le SEUR, M. D	Physician.

Administrative Department.

JESSE YERMAN	Steward, Bookkeeper and Storekeeper.
KATHARINE H. McCLINTOCK	Stenographer.

Engineering Department.

ELMER L. ALGER	Engineer.
HARRY K. MAHLER	Fireman.
MELVIN G. VAN ALSTYNE	Fireman.



New York State School for the Blind. Batavia, N. Y.— Main Building. Front View.

View Westward along Front of Main Building.

Horse Barn. Greenhouse. Hospital.

OFFICERS AND TEACHERS, 1910–1911.

Superintendent..............................CHAS. A. HAMILTON, M. A.
University of Rochester.

Literary Department.

RALPH W. ELDREDGE, A. B., Head Teacher...............High School.
Cornell University.
NITA FORD DUSTIN, B. L..................................High School.
Smith College.
MARY E. SCARFF.........................Seventh and Eighth Grades.
Brockport State Normal and University of Chicago.
HARRIET A. LOUNSBURY..............................Sixth Grade.
Cortland State Normal.
ANNA E. OWENS............................Fourth and Fifth Grades.
Geneseo Normal.
CORNELIA PHELAN.......................................Third Grade.
Lewiston High School.
CHARLOTTE H. WEED................................Primary Grade.
Rochester Kindergarten Training Class.
LENA B. MILLER..Kindergarten.
Utica Kindergarten Training Class.
ANNA M. SWEET..Typewriting.
Newport High School and Albany Business College.

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New England Conservatory of Music and Vose & Sons Factory.

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JENNIE HINSDALE..Stereotyper.

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JOSEPH WEST	Teacher Manual Training, Broom Making. Chair Caning and Mattress Making.

Department of Physical Education.

LESSER ERENSTONE	Physical Instructor.

Household Department.

MINNIE J. GOULD	Matron.
JESSIE D. HINSDALE	Boys' Assistant Matron.
MARIAN S. HUMPHREY	Girls' Assistant Matron.
CLARE SIMPKINS	Assistant Matron.
CLARA M. SHEFFIELD	Housekeeper.
LORENZO BURROWS, Jr.	Ophthalmic Examiner.
J. W. Le SEUR, M. D.	Physician.

Administrative Department.

JESSE YERMAN	Steward, Bookkeeper and Storekeeper.
KATHARINE H. McCLINTOCK	Stenographer.
MABEL B. MYER	Usher.

Engineering Department.

ELMER L. ALGER	Engineer.
HARRY K. MAHLER	Fireman.
MELVIN G. VAN ALSTYNE	Fireman.

FORTY-SECOND ANNUAL REPORT OF THE BOARD OF MANAGERS OF THE NEW YORK STATE SCHOOL FOR THE BLIND.

In accordance with section 18, chapter 744, Laws of 1867, the Managers of the New York State School for the Blind at Batavia, N. Y., present to the Legislature the following annual report covering the fiscal year of 1909–1910:

MANAGERS' MEETINGS.

Meetings of the Board have been held every month, usually on the third Wednesday, and regular monthly reports have been sent to the required State officials. This is the first entire year under the reduced number of Managers, seven now being the legal number. The accompanying table shows a continuation of the good record of attendance shown in past years. No changes have been made during the year in membership, officers, or committees of our Board.

Two special meetings were held, both on April 7th. The first was called by President Lewis for the purpose of meeting with the sewer commissioners of the village of Batavia. The village requested permission to lay through the State grounds the 16-inch force main of its new sewer system. A law was passed by the Legislature of 1910 giving the Managers authority to grant this privilege and to determine the conditions under which the main should be laid. The sewer commissioners offered, in return for the privilege of crossing the State grounds, to attend to the disposal of all sewage from the school, but they requested that the school make the necessary connections with their new sewer system. It was estimated that the expense of making such connection would be over $1,000. The Managers insisted that such connection should be made by the village of Batavia without expense to the school. Their contention was upheld by the

Albany authorities and a contract embodying this provision was prepared at the Attorney-General's office, and finally agreed to by the commissioners.

Immediately after the adjournment of the above-mentioned special meeting, a second special meeting was called at the unanimous request of the six Managers present at the first meeting, and after some discussion upon the condition of the adult blind and their needs in the State of New York, the following resolution was adopted:

Resolved, That the Legislature be asked for a special appropriation of $5,000 (Five Thousand Dollars) to be expended for home teaching of the adult blind in the State of New York under the direction of the Board of Managers of the New York State School for the Blind at Batavia.

REGISTRATION.

For the fourth consecutive year our registration has been 152. There was a slight increase in the number of boys and a corresponding decrease in the number of girls. For the school year ending in June, 1910, we enrolled 93 boys and 59 girls. Of this number 19 boys and 8 girls had never previously attended our school. Fifty-eight, or over 38 per cent. were 12 years old or under. More than half of this number were 10 or under. Fifty-eight were aged 13 to 18 years, and 36 were over 18. These figures show the usual high percentage of young children.

Our registration November 15, 1910, is 84 boys and 62 girls. Of this number 50 are 12 or less, 69 are 13 to 18, and 27 over 18. This shows a marked decrease in this year's registration of older pupils. On the same date we have 18 new pupils, 10 boys and 8 girls, who are registered this year for the first time.

Pupils are registered from 40 counties. Erie leads with 20, Monroe has 15, Chautauqua 10, Genesee 8, Oneida and Onondaga 7 each. These six counties furnish over 47 per cent. of our registration.

During the year two boys were discharged from the school as incorrigible. One boy was transferred to the Craig Colony for Epileptics at Sonyea. One boy and one girl were discharged as being uneducable.

HEALTH.

Two mild epidemics occurred during the year; one of chicken pox with 20 cases in November and December, 1909, and one of measles with 10 cases in February and March, 1910. The cause of the chicken pox is unknown, but the school was infected with measles by a boy who contracted the disease during a brief visit to his home in Buffalo. As contagious diseases had previously been brought to school in the same manner, our Board denied all pupils permission to visit home for several weeks about Easter time.

Our physician's reports for the year show the following diseases: Tonsilitis, 13; German measles, 8; pneumonia, 1; lymphangitis, 1; quinsy, 1. We had no deaths and no pupil seized with any of the above mentioned diseases was considered dangerously ill.

In November, 1909, Fiscal Supervisor McCarthy approved a small monthly allowance to be used for dental work on the teeth of pupils whose parents could not or would not provide the necessary money. This has enabled us to attend to several serious cases of defective teeth and has doubtless contributed to the general health.

Many of our pupils suffer from adenoids, enlarged tonsils or catarrh. At the close of the school in June, 1910, our Superintendent wrote to the parents of a number of pupils thus affected, asking them to have examination made by their family physician. Many ignored the suggestion but others followed it, and several beneficial operations were performed.

CAUSES OF BLINDNESS.

The causes of blindness of the 152 pupils registered during the year 1909–10 as diagnosed by our ophthalmic examiner are as follows:

Ophthalmia neonatorum	38
Optic atrophy	25
Congenital cataracts	14

Other forms of cataract	6
Sympathetic ophthalmia	12
Hydrophthalmos	8
Purulent ophthalmia	5
Congenital amblyopia	5
Purulent conjunctivitis	4
Corneal ulcers	4
Irido-cyclitis	4
Retinitis	3
Retinitis pigmentosa	3
Progressive myopia	3
Detached retina	2
Interstitial keratitis	2
Phlyctenular keratitis	2
Microphthalmos	1
Choroiditis	1
Uveitis	1
Kerato-iritis	1
Atrophy and hemorrhagic retinitis	1
Cataract and sympathetic ophthalmia	1
Choroido-retinitis	1
Traumatic glaucoma	1
Optic atrophy and cataract	1
Ulcerative keratitis	1
Diagnosis incomplete	2
Total	152

This list shows that exactly 25 per cent. of our pupils are blind from ophthalmia neonatorum. Of the 27 registered for the first time, 6, or 22 per cent., are blind from the same cause.

It is an encouraging fact that of the 18 new pupils registered with us for the first time this fall only one is a victim of ophthalmia neonatorum. Congenital cataracts, traumatism and sympathetic ophthalmia account for nine, or 50 per cent.

SUCCESSFUL FORMER PUPILS.

A certain proportion of blind children will never become wholly self supporting, especially is this true of those who are abnormal or sub-normal aside from their blindness. However, the percentage of our former pupils who are wage earners and who are contributing to public welfare and wealth is a matter of which we are justly proud.

Every pupil mentioned in last year's report is continuing to prosper.. The young man who started in at the trucking business, sold out and has returned to tuning. The masseuse reports an increased practice. More of our boys have gone to the East Rochester piano factory where they earn their living almost from the first. Others are drawing good wages at piano factories in Buffalo, Milwaukee, Scranton, Erie and elsewhere. They receive from $8.00 to $20.00 per week.

Our Superintendent had a visit last summer from a totally blind graduate of our tuning department who came in his own auto. Through his work as tuner and the selling of musical instruments he has paid for a comfortable home and educated three children.

In June, 1910, we graduated 7 young men, 4 from the literary, 2 from the tuning, and 1 from the music department. The last mentioned has secured a position as teacher of tuning and pipe organ in the Minnesota School for the Blind. The two tuners located in their native towns, and at last reports had all the business they could comfortably attend to. One of the literary graduates entered the American College of Osteopathy at Kirksville, Mo.

As mentioned elsewhere in our report, one of our literary graduates has been appointed to the position of usher in our own school. She was selected because of her fitness for the position, and the appointment makes what will doubtless be a permanent position for her.

CHANGES IN OFFICERS AND TEACHERS.

Fortunately, we have only two changes to record in our teaching force. Miss Maude E. Hazen, teacher of stenography and typewriting since 1904, resigned in July. She is succeeded by Miss Anna M. Sweet of Norway, N. Y., a graduate of the Albany Business College, and with previous experience as teacher.

Charles R. Beeman, physical instructor for the past two years, resigned in August. His successor is Lesser Erenstone who is qualified for his work by three years of physical training and play ground supervision in Rochester. He is a member of the Rochester Turn Verein athletic and gymnastic team which won the William Randolph Hearst trophy at Frankfort-on-the Main, Germany, in June, 1908.

Beginning with January 1, 1910, we were permitted to employ a visitors' attendant. Miss Mabel Myer, a graduate from the literary department of the school, was appointed to the position. This officer was much needed, as previously, when visitors came, the stenographer was obliged to leave her work to attend them, or pupils had to be called from their classes to accompany them through the school. We welcome visitors and believe they should always be courteously received and afforded every opportunity to observe the work of the various departments. Miss Myer is well adapted to the needs of the position by disposition, manner and experience.

STATE FAIR EXHIBIT.

For the first time in the history of our school we arranged an exhibit at the State Fair in Syracuse in September, 1910. This consisted of samples of work done in the literary, industrial and typewriting departments of the school, various appliances used in the education of the blind, games, point print books, etc. Five pupils also attended in charge of our girls' industrial teacher, and gave concrete evidence that the teachings of our school are practical. One young lady operated a shorthand machine and typewriter. Another ran a sewing machine. A brother and sister rendered musical selections on piano and violin, and a 14-year-old boy caned chairs. The exhibit attracted much attention

View in the Park.

View from Front of Main Building.

and elicited many favorable comments. Governor Hughes visited the booth and dictated a statement to the blind stenographer. Interested crowds surrounded the booth from morning till night. Probably nothing that the school has ever done has brought its work so graphically before such a number of people.

During the fair our pupils and teacher were accommodated at the Syracuse Home for Feeble-Minded, for which our thanks are due to Superintendent Carson and his amiable teachers.

We also sent a small exhibit to the Conferences of Charities and Correction at Albany, in November, 1909; at Rochester, in November, 1910; and the Genesee County Fair, at Batavia, in 1910. Some pieces of wood work made in our boys' industrial department formed part of the exhibit made by the Buffalo Association for the Blind, in October.

MATERIAL IMPROVEMENTS.

Our largest addition under this head is the new storage barn for which an appropriation of $3,000 was made by the Legislature of 1909. The building was completed in the summer of 1910. It is a two-and-a-half-story barn, concrete basement, the rest being of wood. It is just what we have needed for several years. We are using the small balance of this fund to erect a 12 x 36 ft. henhouse.

The books and apparatus fund of $500 has been nearly all used in the purchase of an additional loom, some apparatus for the gymnasium, and some new ink print books.

The Legislature of 1910 gave us the following special appropriations, which Governor Hughes approved:

For refrigerating plant (reappropriation)	$2,000
For typewriters (reappropriation)	600
For new piano	450
Repairs and equipment	1,500
For painting	1,500

Plans and specifications for the refrigerating plant have been prepared by the State Architect, and we hope to have it installed before spring.

With the appropriation for typewriters we were able to purchase sixteen new machines by turning in our old and badly worn machines. We purchased fifteen Remingtons and one Smith-Premier.

The committee which we appointed to select a new piano made arrangements whereby we could secure a new grand piano for use in our chapel, with the appropriation available, by turning in as part payment the old, badly worn Chickering grand now owned by the school. The committee's recommendation was approved by the managers, but the State Comptroller would not permit the exchange. Hence we were obliged to purchase an upright with the appropriation, and we have the old grand still on our hands. We have purchased a rebuilt upright Steinway.

About $1,100 of the painting appropriation has been used where most needed about the building. The balance will not suffice to complete needed work, as we were obliged to use a portion of this fund to repair plastering, hence we are asking this year for an increased repairs and equipment fund in order to complete the work.

From repairs and equipment we have had our boilers covered with brick, the engineering equipment materially increased, and the baker's oven rebuilt. Some furniture has been added, hardwood floor laid in the superintendent's parlor, and lavatories installed in two sleeping rooms occupied by his family.

Our request for an appropriation to erect a new building was granted by the Legislature which voted $35,000 for that purpose, but to our great disappointment this item failed to receive gubernatorial approval.

HOME PRODUCTS.

Table VII shows an increase in the value of our farm and garden products. Our hay crop was especially good and we cut more than we shall use during the year.

For some reason we are unable to obtain a good yield of potatoes. Whether planted after sod ground or stubble, and even when well manured our yield is scarcely 100 bushels per acre. Our apple crop also is short this year.

SPECIAL NEEDS FOR THE YEAR 1910–1911.

We have asked the Legislature of 1911 for the following special appropriations:

a. One new building	$35,000
b. For stairway approach to gymnasium	1,200
c. For repairs and equipment	2,500
d. For cement walks	500
c. Books and apparatus	500
f. One new piano	450

We present the following facts upon which we base our request for these special appropriations:

a. One new building $35,000

We desire a building that shall accommodate 40 or 50 pupils. Our present pupils' sleeping rooms are over crowded. One room with 2,676 cubic feet containing only one window, has six beds. Several rooms with 3,100 cubic feet contain four beds. We have for years had to utilize piano rooms and corridors for sleeping purposes. Neither boys nor girls have any play room nor sitting room but must live in their bedrooms. These conditions have been repeatedly criticized by inspectors.

It should be remembered that the scope of the school has tremendously expanded during the past twenty years. We now have a literary department, music department, industrial department, department of physical training, and most of our pupils take typewriting. These have necessitated the employment of extra teachers, and the use of more rooms for music practice, lessening somewhat the number of rooms formerly used for sleeping purposes. The available room is insufficient, especially for our kindergarten department, girls' industrial and music department.

Again, for moral reasons which are perfectly obvious to everybody, our younger pupils ought to be separated from the older ones.

The new building as planned would release upward of twenty rooms in our main building and relieve the congested and crowded condition.

b. For stairway approach to gymnasium........ $1,200

The present steps have been repeatedly condemned by State Architect's inspectors as unsafe. Frequently large crowds come to this building to attend evening exhibitions. Plans for the new stairway, as drawn by the State Architect, involve the use of concrete and stone which will make them durable, permanent, and in keeping with the rest of the building.

c. For repairs and equipment................ $2,500

We roughly estimate the needs of this fund as follows: Painting in various places, $1,000; installation of dish washer and vegetable parer, $400; new chapel platform, $200; roof repairs, $100 to $200; gravel for drives, $60; balance needed for incidentals and unforeseen needs.

d. Cement walks $500

Needed to complete our system of walks by laying walk on west side of park and east side of Ellicott avenue from Park avenue to present Richmond avenue walk.

e. Books and apparatus...................... $500

To be used for increasing and maintaining our equipment for purely educational purposes such as books and apparatus especially designed for the use of the blind.

f. One new piano.......................... $450

We have 21 pianos in use. One purchased every year enables us to discard a piano after twenty-one years' service. The amount asked for enables us to purchase a high grade piano which is by far the cheapest in the long run.

While all these appropriations are needed, we wish again to emphasize, as we have repeatedly in former reports, the urgent necessity for the additional building to provide additional accommodations, and to relieve the present congested conditions in our main building.

FINANCIAL.

In our last report we noted a decrease for the fiscal year ending September, 1909, both in our total expenditures for maintenance and our per capita. This year, as may be seen by tables IV and V, we are obliged to report an increase in both. According to these tables the increase in total expenditures is $1,741.21, and the per capita increase $26.55. It should be remembered, however, that we were obliged to carry over a deficit from September, 1909, of over $600 for expenses which properly belonged to the previous fiscal year. If we were to subtract this amount from our present year's expenses and add it to those of the previous year, where it properly belongs, it would make the net increase only about $540, and the per capita increase about $6.

The following are the items showing the principal increases with a brief statement of the reasons:

Expenses of Managers, $474.10. Due to Managers and Superintendent attending meetings of Managers' Association and Purchasing Committee in Albany when summoned by the Fiscal Supervisor.

Provisions, $920.95. $407.46 of this amount carried over from September, 1909. Balance due to increase in cost.

Household stores, $238.17. Due to purchase of items under maintenance fund previously estimated for against repairs and equipment.

Hospital and medical, $71.56. Caused by monthly allowance for dental work, nearly all of which will be returned to the school from the various counties.

Shop, farm and garden, $954.94. Over half of this increase due to rent of horse in place of one that died, and purchase of new farm team. Balance due to purchase of items for industrial department formerly estimated for against industries and maintenance.

A part of the per capita increase is due to a slight decrease in the average daily attendance.

It is a cause for gratification that, in spite of making up the deficit of the preceding year, we close the fiscal year ending September 30, 1910, free from debt for the first time in several years. This was accomplished only by rigid economy.

Sometimes comparisons are made between the per capita cost at our school and the relatively lower per capitas of other institutions reporting to the Fiscal Supervisor. When making such comparisons certain facts should always be remembered. Ours is a school, not an institution for correction or detention. As teaching the blind is largely an individual work, our teaching force is relatively large. The salaries of our teachers including stereotyper aggregate nearly $11,000, which is over 40 per cent. of our pay roll and 24 per cent. of our entire cost of maintenance. This item is very small in many other institutions, yet we could not well dispense with a single teacher, but need more rather than fewer.

We cannot secure much assistance from our pupils in performing either household labor or that required in the farm and garden. This is partly because of their blindness but mainly because it is unjust to take them from their school work except occasionally. This makes our number of laboring employees seem large.

We also feel that it is proper that our pupils be provided with a larger variety of food than is necessary in some other institutions which are of a correctional or custodial character.

While all these things tend to increase our per capita we know that none of our maintenance fund is wasted or used extravagantly. The success of so many of our former pupils proves that the money spent on their education has been an excellent investment from a purely economic standpoint, while the contentment and happiness disseminated by our school are items which cannot be measured by the dollar unit.

GIFTS TO THE SCHOOL.

We wish to make public recognition of the receipt of several bound volumes of the reports of our school, and of the meetings of American Association of Instructors of the Blind. Also several other books on matters pertaining to the blind. These books were presented by Mrs. H. F. Tarbox of Batavia. They formerly belonged to Mrs. A. D. Lord who was at one time superintendent of the school. The receipt of these reports gives us a complete file of the reports of our institution since its establishment.

THE ADULT BLIND.

We have already mentioned the special meeting of our Board held April 7th, at which time a resolution was passed asking the Legislature for a small appropriation with which to make a beginning at home teaching of the adult blind. The need of something along this line becomes more apparent every year. Applications from adults who seek admission to our school are received monthly, but have to be rejected because of lack of proper accommodations for applicants of school age. Last winter we allowed a man over 50 years of age to enter the class in broom making, he obtaining room and board outside. After a few months he left to go into partnership with another blind man in the manufacture of brooms. His gratitude to the Board for making this concession was touching in the extreme.

Under date of November 12, 1910, he writes Superintendent Hamilton as follows: " I don't mind my blindness now. I am well and happy. I make about 15 dozen brooms a month. I sell the malt houses here, in Newark and in Clyde heavy barn brooms, and also supply three sauerkraut factories. I also make a house broom for the local trade. I sell all I make and at a profit. I borrowed $200 to begin business. I have $170 now in hand besides my machinery and a good stock. I have helped also toward the support of my home." How significant are his opening sentences. He doesn't mind his blindness now, and is well and happy because he is busy and earning money. This is one instance where we were able to give assistance. There are scores of men and women throughout the state who have lost their sight since passing school age, and who should be provided with some means of learning to read and to perform some manual work. New York is far behind some of the sister states in this matter. If the State is not yet ready to establish a special institution for teaching the adult blind, she should at least furnish them with some comfort by providing a few home teachers to be judiciously distributed about the State, and we stand ready to take the initiative in this work whenever the necessary funds are provided.

Respectfully,

DR. F. PARK LEWIS, Chairman,
MRS. H. A. HUMPHREY,
WILLIAM C. CASEY,
Committee.

MONTHLY ATTENDANCE OF MANAGERS.

MONTHLY ATTENDANCE.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	Average.
1906–1907	6	7	6	7	4	6	5	6	7	7	6	8	6.25
1907–1908	8	8	6	8	7	8	8	8	8	8	6	6	7.4
1908–1909	8	6	8	6	6	6	6	6	6	6	6	6	6.33
1909–1910	7	6	5	6	5	6	6	7	5	6	5	5	5.75

The Senior Choir.

Blind Girl Weaving Rugs.

REPORT OF SUPERINTENDENT TO THE BOARD OF MANAGERS.

To the Board of Managers, New York State School for the Blind:

Another year of effort is past; another year of experience is added to the lives of us who are engaged in the work of educating the blind. The year has had its failures, but they have been few compared with successes achieved. We truthfully and enthusiastically report progress and note many facts that tend to encourage us.

The reports submitted by the heads of the various departments contain the main facts of interest together with some suggestive comments. Our literary work still follows both in grades and high school, as closely as possible that outlined in the Syllabuses issued by the New York State Education Department. Our teachers endeavor, in addition, to lay special stress on those subjects with which our pupils find difficulty. The number of our academic pupils is slowly increasing. Of our seven graduates in June, 1910, five had completed the academic course.

In the spring of 1910 our older boys formed an association which they named the Young Men's Literary Society. Its purposes are the study of parliamentary practice, rules of debate, and general literary exercises. A constitution and by-laws have been adopted and the meetings are conducted along strict parliamentary lines. The literary programme of each meeting is arranged by an executive committee, and consists of debates, both impromptu and prepared, readings, recitations, songs, etc. These meetings supplementing the chapel talks required of our academic pupils are helping many of our boys to "find themselves," when on their feet in an assembly, and in a few cases have developed embryonic oratorical ability. I believe also that the society fosters an *esprit de corps* among our boys, and will be of value in promoting loyalty to our school.

The report of our Musical Director calls attention to some new methods which she has introduced. I have seen the reading of music by the chorus classes from the stereotyped page, and class teaching of beginners on the piano in other schools for the blind and have heard these methods strongly endorsed. I claim little knowledge of music myself but I am convinced by the favorable comments of musicians who visit our school, and from the excellence of results obtained, that this department is being kept up to its usual high standard. Our pupils invariably distinguish themselves in the examinations in theory set by the State Education Department.

Few changes have been made in the boys' industrial department. All the grade boys are required to take some form of manual training. Not all can do the same work and it taxes the ingenuity of the teacher to find that specific work best fitted to the development of manual ability in the individual. Some have considerable skill at sloyd, others fail at this but become interested in caning. The teaching of broom and mattress making has been continued along the usual lines. We manufactured about one hundred dozen brooms of various sizes, and sold $353.43 worth. The greater portion of these were retailed by our boys. They buy them of the school and peddle them on Saturdays. They thus receive training in actual business. They also sometimes sell brooms during the summer months. This is an incidental benefit which is of considerable value to many of them.

In the girls' industrial department the work has also been graded, and all girls of grammar grade are required to spend a daily period in sewing, knitting, etc. The results obtained from the one loom purchased last year led us to procure another this year in order to enable more girls to learn the art of weaving. The permanency of this feature of our work is assured.

Our last year's physical instructor left without submitting any report of his department. His good work bore fruit in increased lung capacity, and general bodily development of the pupils.

A strong athletic spirit is in evidence among our boys. An indoor meet for boys was held February 21st, participated in by a number of the schools for the blind throughout the United States. In this contest our school stood second in points earned, and one of our pupils stood first in individual points. On May 21st occurred the annual outdoor track meet in which our boys earned fourth place. On May 30th three of our boys took part in a meet at Overbrook, participated in by athletic teams from Overbrook, Boston, Pittsburgh and Batavia. Our team won second place. This last event deserves more than passing notice as it was the first time in the history of America that blind students representing different schools met in athletic competition on the same athletic field. A cinder running track has been built furnished with guide wires, and a large number of our totally blind boys are making use of it.

About the usual number of male pupils have been studying tuning. In accordance with the resolution introduced in the managers' meeting by our industrial committee, the prospective graduates from this department were last spring examined by an outside examiner. The following is his report:

BATAVIA, N. Y., *June* 7, 1910.

To the Board of Managers, of the New York State School for the Blind:

GENTLEMEN.— Having been appointed by you to conduct an examination of the graduates in the tuning department, and to submit to you my opinion as to their qualifications, I will say that it affords me much pleasure to state that they have passed an examination which is, in my opinion, highly creditable to them and to their instructor, as they were able to practically demonstrate to me that the work has been thoroughly and satisfactorily done, giving them an average of 90 per cent.

Respectfully submitted,

J. H. FITCH.

In our household department we are having some difficulty in obtaining a satisfactory amount and quality of help. The remuneration we can offer domestics is less than the amount they can earn in several shops and factories in Batavia. We have frequently had to take on inexperienced girls and teach them how to do the work properly. Other institutions report much trouble of the same kind. It seems to me that the only remedy would be ability to pay them a sufficient wage to attract them to this work. I believe the schedule of pay for our domestics has not been changed in a long time.

I was last year appointed a member of the Purchasing Committee for the institutions reporting to the Fiscal Supervisor, and in September, 1910, was honored by being elected chairman of the annual meeting of the Managers and Superintendents, which carries with it the chairmanship of the Purchasing Committee for the year. This is proving a valuable business experience to me, and I have been enabled in several matters to benefit the school. The Purchasing Committee has become an important factor in the administration of our institutions, for to it is entrusted the responsibility of formulating specifications and letting contracts for approximately $436,000 worth of supplies. We believe that the present specifications are sufficiently high and contracts binding enough to guarantee to the institutions a satisfactory quality of supplies.

The amount of clerical work necessary to meet the " red tape " requirements of Albany officials is increasing yearly. An undue, and I sometimes think an unnecessary portion of my time is taken up in the making of reports, tabulating statistics, and furnishing information required by some department of our state government. This has also greatly increased the work of our steward and stenographer. At times I almost forget that I am engaged in educational work, so limited is the time I can find to spend in the class rooms and in the study of educational problems. I do not offer this as a criticism as my relations with all the state departments have always been cordial, but I think that they should ever bear in mind that the only justification of additional "system" is the certainty that it will increase the efficiency of our school in fulfilling the purpose for which it was established, namely, the education of the blind boys and girls of the state.

It was my privilege in June, 1910, to attend the convention of the American Association of Instructors for the Blind held at Little Rock, Arkansas. The meeting was helpful and inspiring in the extreme. An excellent programme was presented and I broadened my acquaintance with other superintendents and teachers of the blind. They are men characterized by ability and devotion to their work. The discussions at the meeting showed that they differ in their methods but that they are unanimous in their earnestness of purpose and their desire to serve well and wisely the cause to which they have consecrated their energies. This convention manifested its interest in the work of prevention of blindness by passing a resolution endorsing past efforts in this direction, and appointing a committee to co-operate with the American Medical Association.

I also attended the annual meeting of the trustees of the American Printing House for the Blind at Louisville, Ky., on July 2nd, and visited that truly wonderful plant which prints most of the books for the blind used in the United States.

In closing it gives me pleasure to acknowledge the very cordial co-operation of each and every one of your Honorable Board of Managers.

Yours respectfully,

C. A. HAMILTON,

Superintendent.

THE HIGHER EDUCATION OF THE BLIND.

(Read by Superintendent C. A. Hamilton at the National Convention of the American Association of Instructors of the Blind, held at Little Rock, Ark., June 28 to July 1, 1910.)

It would seem unnecessary in a convention of instructors of the blind, to present a defense of higher education for the blind. Yet we occasionally hear the value of such education belittled, even by instructors and superintendents themselves. There is, moreover, a tendency in nearly every field of educational endeavor to place large emphasis on the importance of industrial education. This is a natural result of the commercialism of our century, and is not to be greatly regretted, for thousands of students to whom the old style curriculum did not appeal or seem adapted, have pursued with interest a commercial course or completed some line of industrial instruction, thus the better fitting themselves to fill a place in the economic world. Education in America will probably never eliminate these commercial and industrial courses, for they were adopted in response to a popular demand and they supply a legitimate need. I venture to assert, however, that in the minds of many educators, not only of educators but of leaders in thought and action everywhere, nothing will ever satisfactorily take the place of that broad cultural training — old fashioned it may be called — which has for its main purpose the development of the student's mental powers, the sharpening of his mental faculties, the creation of ability to think carefully, reason logically and solve correctly the various problems of life. Neither the specializing of mental training nor any form of manual training will accomplish this result. We admit of course, that an industrial education, by most people termed a practical education, is best adapted to the majority of blind as well as to the majority of sighted students, but that minority of blind students, however small it may be, who possess that combination of ambition, ability and wisdom to apply knowledge, which will cause them to appreciate and use wisely a college or university training, should have at least the same encouragement to prepare for it and the same opportunities to acquire it as are afforded their sighted friends. We cannot measure the influence that an educated sightless man may wield in the world. Even if it should not prove to be as great an assistance as he had hoped for from a mere bread and butter standpoint, the efforts expended in securing such education are by no means wasted. Education is a boon of the greatest value to any person possessing the ability to acquire it, and especially is it so to a blind person who is obliged to live so largely within himself. For such a person there is nothing so efficacious as a liberally trained mind to transmute the black lead of despair into the gleaming gold of hope or at least into the shining silver of contentment.

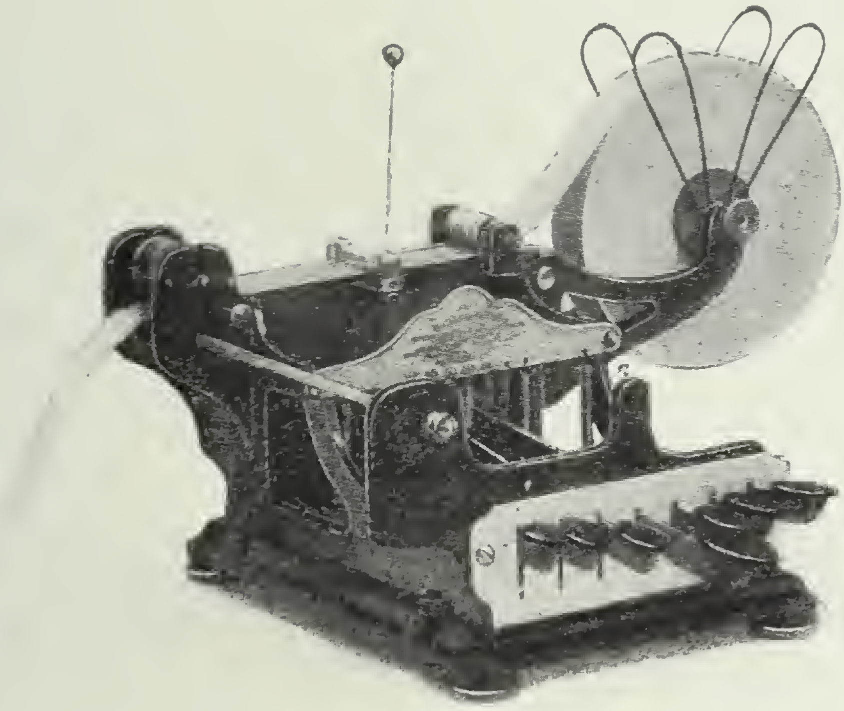
Admitting then the propriety and value of a higher education for the blind we naturally come to the question, " what collegiate subjects or courses of study are most valuable for a blind student to pursue?" In preparing this paper I asked this question of a number of educated blind men in the United States, and I quote quite freely from their replies. One writes: "Any blind person who may attempt to pursue what is called 'the higher education' should receive a good training in all the non-technical departments of general knowledge, that he may be like those sighted persons who have taken the A.B. degree. I believe the blind student should give special attention to those branches which require little or no use of diagrams, symbols or apparatus. He can in after life continue the study of such subjects with the aid of any fairly good reader. Should he wish to write upon such subjects he can do so by means of an ordinary typewriter, and should he desire to teach, these are the subjects which he can most readily explain to his pupils whether they be blind or sighted."

Another correspondent who is a very successful lawyer writes: "This question of necessity opens a vast field for discussion and fruitful inquiry. The subject which I selected was the law because I believed that I was personally better adapted for that course than to any other that I might choose. But to look at the matter broadly it seems to me that the subjects best calculated to meet the conditions in which the blind find themselves and which will afford a reasonable means of livelihood as well as a high intellectual development are, theology, law, medicine and such a classical or general university course as will fit the individual to become a teacher. I do not believe, however, that it is possible to lay down any one subject as absolutely preferable to all others for the higher education of the blind since to do so would be to overlook the elements of personal environment, adaptability and preferment."

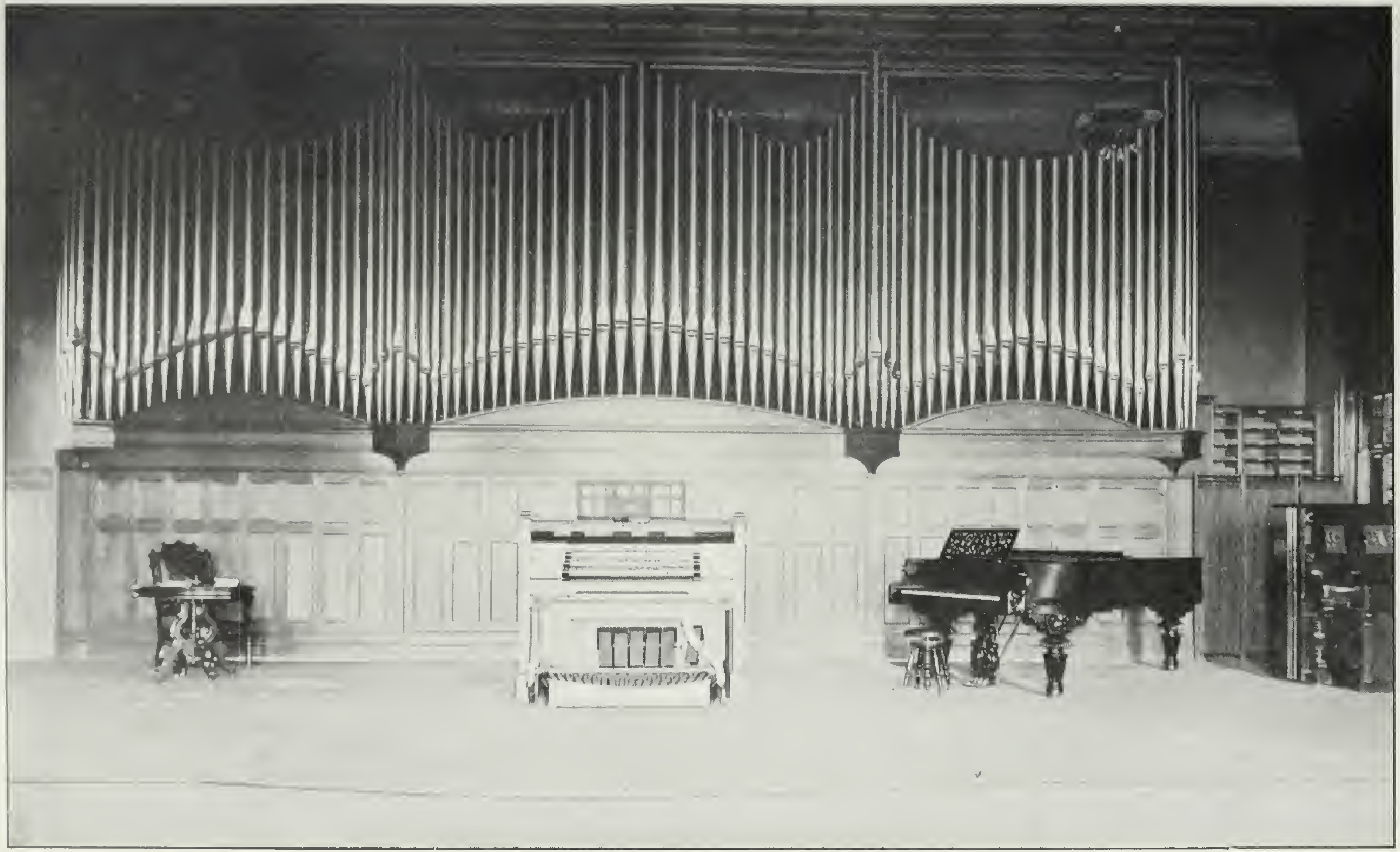
This same writer gives cogent reasons for mentioning these specific subjects, and certainly his success in his chosen profession is proof of the wisdom of his own choice and entitles his opinions to due consideration.

From the letter of a recent college graduate whose scholarship entitled him to a Phi Beta Kappa key I quote as follows: "As to what subjects a blind person ought to study, it seems to me that this is precisely the same question which the average young man faces and must be decided in just the same manner. It depends first on the profession for which he is preparing. Another consideration is the student's preference and this would show as great a variety as in the case of sighted people. Most blind students whom I know have been classical or language students and some have studied mathematics. From a merely cultural point of view I cannot see that it makes much difference. Experience has shown that a blind person can do satisfactory work in almost any department in college, although in doing profitable laboratory work he is necessarily hampered."

It seems to me that the following quotation, the last one I shall give on this division of the subject, covers the ground in a very satisfactory manner: "There is no single subject or line of study pertaining to higher education that I consider most valuable for the blind, for the reason that the sightless are as diverse in their powers and needs as are the sighted. One, like Prof. L. B. Carll, may become the author of the most advanced mathematical treatise in the language. Another, like Dr. Babcock, may become a noted lung and heart specialist. One like Senator Gore may go into public life. Another, like President Nolan, may engage in the practice of the law. One, like Helen Keller, may become equipped for wide usefulness with pen or tongue and for effective activity as a social worker. Another, like Prin. H. H. Johnson, may become a general school teacher and teach-



Embossed Shorthand Machine.



Our New Pipe Organ.

ers' institute worker, or, like my friend, L. A. Chase, may specialize in history and civics while fitting himself for miscellaneous teaching and press work as well. Some will fit themselves by conservatory courses for leadership, or at least for creditable success in musical circles; some will become successful reporters, editors and newspaper men; some will acceptably preach the gospel and make records in the building of needed churches and filling them with devoted worshipers; and some will become successful business managers and helpers in less conspicuous ways, useful alike to themselves, their families and their fellow citizens. They may not be marvelous musicians nor mental or mechanical geniuses, inventors, authors or discoverers, and yet with fair ability, a capacity and disposition for hard work, and the necessary opportunity for thorough preparation, many sightless secondary students would abundantly justify the cost of the higher training needed to fit them to find out and creditably occupy their several spheres of greatest usefulness in those walks of life in which the lack of sight handicaps a competitor relatively less than it does in our simplest mechanical pursuit. Any plan of higher education that would tend to straight-jacket blind students or switch them into callings for which they may have no taste, bent or native aptitude, might well be opposed by the blind and their friends."

These writers do not all differentiate between a cultural college course and a professional training, but their letters clearly establish the fact of a diversity of tastes, needs and powers among the intelligent blind. To minister to these needs and to develop these powers, there is needed the same variety of curricula that is furnished sighted students. A recognition of this fact will materially assist us in answering the next and more important question, "Should this education be given in a special college established for the higher education of the blind or in the regular institutions of higher learning already established for sighted pupils?" On this point also I asked the opinion of my correspondents, and they were unanimous in declaring that it would be a distinct disadvantage to the blind to be obliged to take their collegiate course in a special college established specifically for them, but that on the contrary their own best interests demand that they pursue their college course in one of the abundant and well equipped institutions of higher learning already in existence. I give briefly some of their reasons as follows:

A separate national political college for fifty, eighty, or even one hundred and fifty blind students of widely varying tastes and needs, could not efficiently or economically meet their diverse requirements; nor could it confer diplomas that would be generally recognized as evidence of proficiency, however much such certificates might distinguish their holders from uneducated victims of like deprivation. The best available training, whether for professional, political, literary, commercial, technical, or philanthropic career, is best secured in close association with normal people who will occupy the same walks in life, and under the influence and inspiration of really eminent teachers. The opportunities of qualified workers in almost any walk of life, depend largely upon an intimate acquaintance with fellow workers or fellow alumni. A blind graduate from a special class college would have little such assistance in discovering openings for employment.

Another writer expresses similar ideas in these words: "It is better for the blind student after an institution training to continue his course in company with the sighted, as he will there find greater incentive for hard work and will become more familiar with the ways of those with whom he will be obliged to compete in after life. Furthermore, any degree given by a special college would have little weight with the general public."

A third writes: "The expense of a special college supported either by government resources or by endowment would be almost an economic waste, since the number of the student body would not ordinarily be commensurate with the amount of the endowment necessary to establish a university as broad and comprehensive as those we now have."

A reciprocal advantage to the sighted was given in one letter in the following words: "I have also been told that I did not appreciate the influence I have upon the many students who know me, so perhaps the thing is of mutual benefit."

Senator Gore, who is not a college-bred man, makes the following emphatic statement which, from the context, is evidently intended to apply to all education for the blind: "I think it is a calamity, almost a crime, to segregate these children and bring them up in a cloister, separated from the boys and girls among whom they must live, which defeats the very object and the very end of education. The object of education is to fit the student for life in the actual world among the practical men and women who make up the world."

Granting the propriety of furnishing through existing institutions higher education for the blind, we come to the question, "What means should be provided to enable them to pursue their collegiate course, and how should such means be provided?" To the first part of the question I would say, they should be given the same help as sighted pupils and no more. I do not sympathize with the idea that they should be clothed and fed while in college with no expense to themselves. Such generosity, although well-meant, smacks too much of that indiscriminate charity from the influence of which we are ever trying to save our pupils. Some effort and sacrifice should be demanded of the pupil himself to the end that the value of his college degree may be enhanced by the difficulty of the purchase, and that he may be saved from the notion that his physical limitation entitles him to be an educational deadhead. The blind applicant for college honors should, however, be provided with a scholarship, something which thousands of his sighted brothers enjoy, and with a pair of eyes which all sighted students have. There is neither charity nor lass legislation in providing him with these; they merely put aim on the same footing as his classmates.

Now how shall these be provided? By private subscription, by alliance with some organization, such as the Carnegie Foundation, by State aid or by federal assistance? New York State has answered this question by passing the following law: Section 926, article 38, of the Education Law: Employment of Reader for Blind Students: "Whenever a blind person, who is a citizen of this state and a pupil in actual attendance at a college, university, technical or professional school located in this state and authorized by law to grant degrees, other than an institution established for the regular instruction of the blind, shall be designated by the trustees thereof as a fit person to receive the aid hereinafter provided for, there shall be paid by the state for the use of such pupil the sum of three hundred dollars ($300.00) per annum with which to employ persons to read to such pupil from textbooks and pamphlets used by such pupil in his studies at such college, university or school.

"Such moneys shall be paid annually, after the beginning of the school year of such institution, by the treasurer of the state on the warrant of the comptroller, to the treasurer of such institution, on his presenting an account showing the actual number of blind pupils matriculated and attending the institution, which account shall be verified by the president of the institution and accompanied by his certificate that the trustees have recommended the pupils named in said account as hereinbefore provided. The trustees of any of the said institutions shall recommend no blind person, who is not regularly matriculated, and who is not in good and regular standing, and who is not working for a degree from the institution in which he is matriculated; and no blind person shall be recommended, who is not doing the work regularly prescribed by the institution for the degree for which he is a candidate. The moneys so paid to any such institution shall be disbursed for the purposes aforesaid by and under the direction of its board of trustees."

Since the passage of this law in 1907 ten pupils have taken advantage of it attending five different colleges. The Legislature has always provided the necessary funds for readers and some of the regular scholarships have usually been available. One possible defect of the law is the fact that no provision is made for pupils who desire to attend a professional or technical school of a class which is not represented in New York State. For example, two Batavia graduates have been unable to take advantage of the law because they are studying osteopathy and there is at present no school of osteopathy in New York State. On the whole, however, the law works very satisfactorily and has given a marked impetus to the cause in our State.

My personal opinion is that the State government is the proper source from which to ask the assistance which we need. Our existing secondary schools for the blind are either State institutions or are supported in part by State funds. Practically every State has also its State university or State scholarship at some college. A slight expansion in every State of these two alredy existing systems would very satisfactorily supply what we need. It seems perfectly logical to ask our States for this expansion since education is a recognized function of the State. State aid would not suggest charity as would reliance upon some foundation. Assistance from this source could be more easily obtained than from the federal government. Most of our educational workers are in touch with certain legislators in their own State and could bring some influence to bear. Legislators themselves would be more responsive when approached on a matter of home interest. All attempts to secure favoring legislation from the United States government have thus far failed. The Empire State has shown us a possible, logical, and practical solution of the question. Other States would doubtless improve upon the New York State law. The experimental stage would soon be passed and from the combined experiences of the several States something approaching an ideal and uniform law would develop. Another act of justice would be consummated, another step taken in civilization.

Whatever legislation is ever obtained will necessarily come from the efforts of the educated blind themselves and of us who are interested in their welfare, and it can be obtained only by strenuous, united effort, by casting aside all differences of detail, and joining hands upon the main object for which we are working.

REPORT OF THE LITERARY DEPARTMENT.

Mr. C. A. HAMILTON, *Superintendent, New York State School for the Blind:*

DEAR SIR.— The literary department offers the following report for the year 1909–1910:

Subjects.	Boys.	Girls.	Total.
Kindergarten	19	11	30
Reading	33	21	54
Spelling	49	21	70
Writing	25	16	41
Arithmetic	53	36	89
Geography	41	29	70
Language	33	21	54
Elementary English	8	9	17
English, second year	4	3	7
English, third year	4	4	8
German, first year	6	6	12
Cæsar	2	4	6
Cicero	2	2	4
Virgil	2	......	2
History, ancient	4	3	7
History, United States and Civics	17	15	32
Algebra, elementary	6	4	10
Geometry	1	......	1
Physiology	37	24	61
Physics	7	1	8
Botany, elementary	7	6	13

The class in business forms and methods has been omitted this year because the number of applicants (one) seemed insufficient to justify the formation of a class to continue through the year.

This unwillingness on the parts of the students to take up the work does not mean, however, that they do not like the work. They do like it. But since it leads to no Regents' counts for graduation the students feel that they have not the time to pursue the work, wishing, as they do, to complete their work for graduation in four or five years. However, we are planning to arrange a class in this subject at the middle of the present school year.

Two years ago the custom of having our pupils of academic grade give a short talk immediately after chapel was initiated. In this talk they gave some literary production, recitation, essay, debate or current topic. This work proved to be very beneficial to our students, so we have required this year that all students of academic grade, or who are taking academic English, give a talk. These are called "chapel talks" and are given once each half year.

At the beginning of this year our male students organized the Young Men's Literary Society. The purpose of this society is to train our boys in parliamentary practices, debating, public speaking and allied topics. This society is not exclusively a function of this department but, because of its general literary nature, we feel justified in reporting it from this department. It is a good thing for our students.

Respectfully submitted,

RALPH W. ELDREDGE,

Head Literary Teacher.

REPORT OF THE MUSICAL DEPARTMENT.

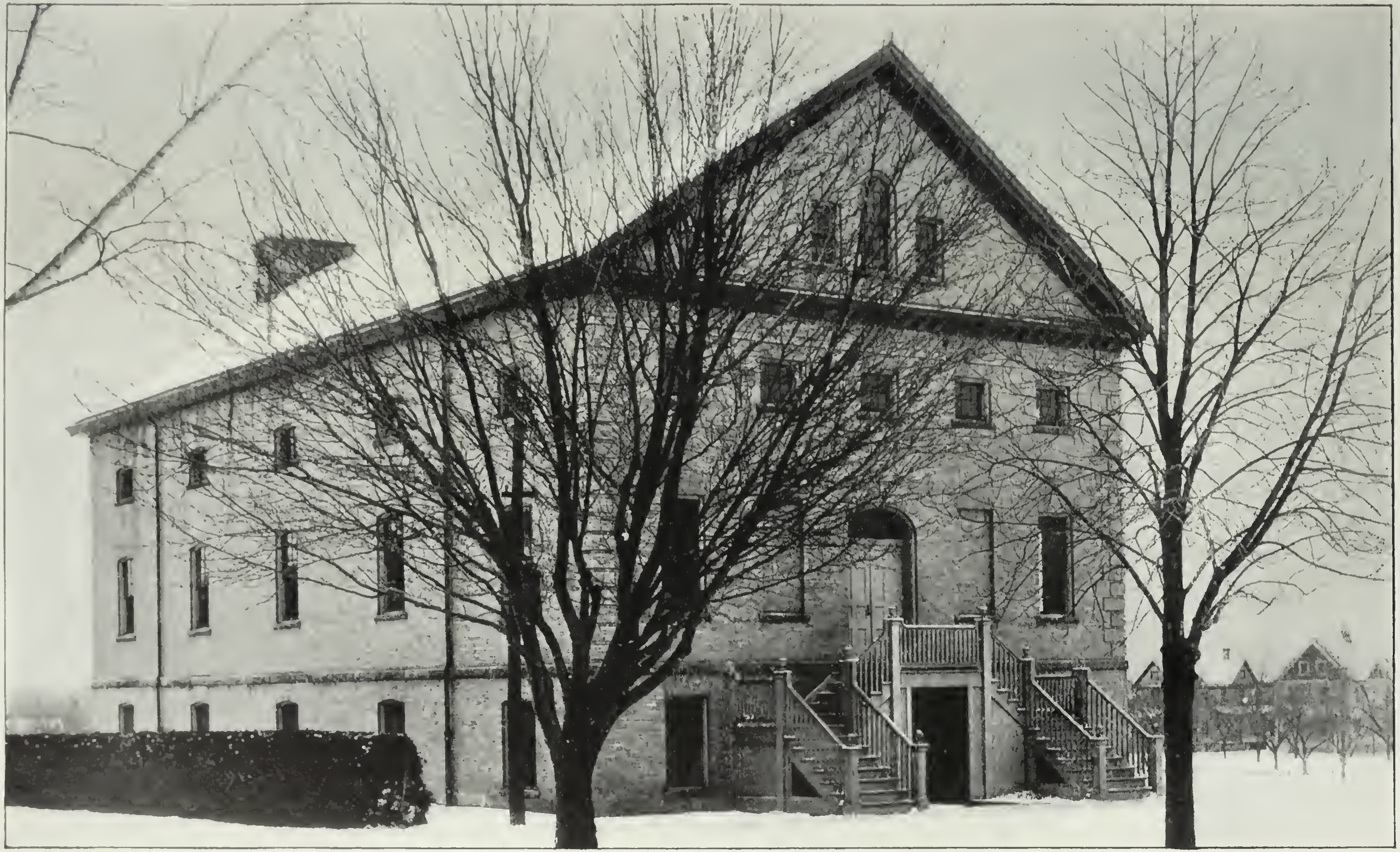
Mr. C. A. Hamilton, *Superintendent, New York State School for the Blind:*

Dear Sir.— The following report is from the Musical Department for the year 1909–10.

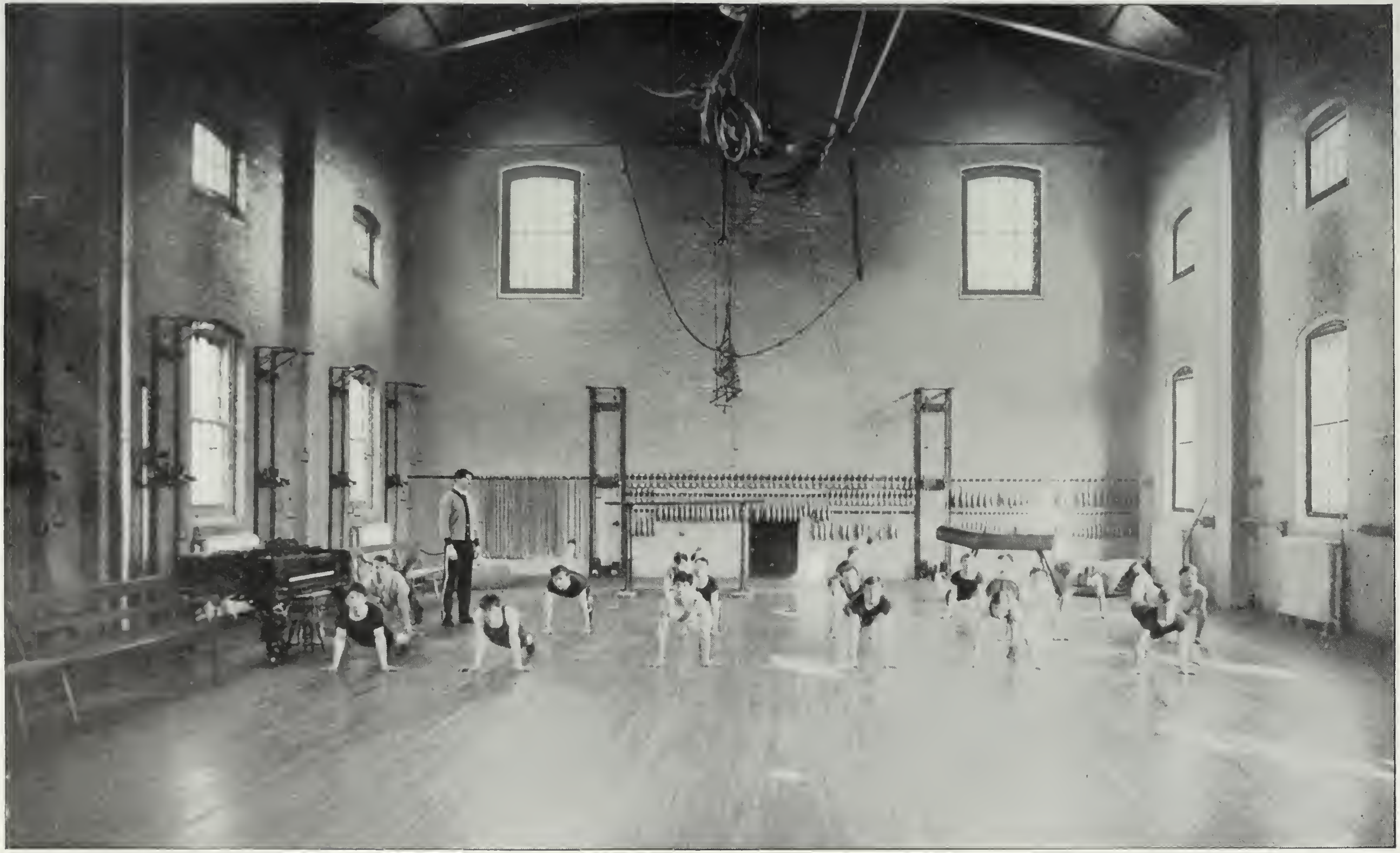
The past year was a busy one for both teachers and older pupils who act as tutors, as the number receiving individual instruction exceeded that of the previous year. A class of six in beginning piano was conducted for twenty-five minutes daily, under the direction of a teacher and assistant. They studied hand-formation at the table, exercises in time drill and rudiments of music, together with point print notation. The experiment proved satisfactorily that several beginners could get their training at the same time, and similar classes will be formed whenever the pupils from the waiting list are of the same grade.

The first to graduate in music since the requirements were made to correspond with the course outlined by the Education Department of New York State, was Thompson Courtney in Organ and Theory. Soon after he was fortunate in receiving an appointment in the State School of Minnesota at Faribault, as teacher of tuning and organ. The nature of his own work as well as his valuable assistance in tutoring, both piano and organ as well as choir, gives reason to expect that he will be successful in his position.

There were candidates for the Regents examinations in June, in Music History and Acoustics, Harmony and Counterpoint and Ear-training. While there have been no failures in the tests in music subjects, two papers of last June were of exceptional merit, one in Harmony at 97%, the other in Ear-training at 99%. Mr. Courtney in the latter subject by using a shorthand machine was able to write the exercises as fast as they were played on the piano. We had before attempted to use the point print slate, which was



New York State School for the Blind, Batavia, N. Y.
Gymnasium.



A Gymnasium Class Exercise.

too slow for the time limit, or the kleideograph which was so noisy it was difficult to hear the values in metrical exercises.

The senior choir of forty learned ten choruses in addition to the hymns and patriotic songs for daily chapel exercises. As the members grow more independent in reading the parts from point print, they not only learn faster, but more accurately. After the chorus has been given out, the choir hour is spent in putting the parts together instead of teaching each part a phrase at a time by rote as formerly. The introduction of sight reading has made a decided improvement in every way.

In addition to our regular weekly recitals, we were fortunate in having several from students working elsewhere. Miss Lillian L. Hawley, Miss Elsie Kennedy, and Mr. R. L. Trick, from Buffalo, and Miss Frances L. Hobbie, of New York, gave three programs of selections with which our oldest pupils were familiar. In a conservatory the playing of advanced students is often as helpful as that of an artist, and it is of decided advantage for those studying here to recognize how their difficulties have been overcome by other earnest workers in a less isolated musical world. Mr. Edward Baxter Perry opened the season with one of his interesting lecture recitals, and Mr. Walter Bentley Ball gave a delightful evening of folk songs.

The programs of the public recitals will be found elsewhere.

Respectfully submitted,

JULIA S. LOOMIS,
Music Director.

REPORT OF THE GIRLS' INDUSTRIAL DEPARTMENT.

Mr. C. A. Hamilton, *Superintendent, New York State School for the Blind:*

Dear Sir.— It gives me pleasure to submit the following report to you from the Girls' Industrial Department:

Forty-seven girls were enrolled for the year. A larger class of younger girls than usual have had instruction. I am convinced that we cannot begin the training of the fingers too young. The older girls have a variety of work and always manifest great interest in learning new things. There has been decided advancement in the quality of work by the older girls.

The following articles have been made this year:

Aprons, 45
Bathrobes, 3
Blouses, 11
Corset covers, 5
Chemises, 2
Drawers, prs., 12
Doll hammocks, 3
Doll jackets, 1
Dresses, 8
Dust cloths, 10
Mattress covers, 7
Napkins, 72
Night gowns, 13
Night shirts, 7
Piano cover, 1
Pillow slips, 217
Petticoats, 7
Porch pillow, 1
Rugs, woven, 12
Sweaters, 2
Sheets, 39
Slippers, knitted, prs., 10
Shawls, knitted, 4
Tray cloths, 3
Towels, 48

In addition to this work the girls do a good deal of mending. One day of each week we devote to weaving, basket work, and a few girls have taken up chair caning.

Respectfully submitted,

HARRIET E. PIERSON.

REPORT OF THE TUNING DEPARTMENT.

Batavia, N. Y., *Nov.* 14, 1910.

Mr. C. A. Hamilton, *Superintendent:*

Dear Sir.— I present the following data pertaining to the work done in the tuning department during the school year 1909–10:

Pupils previously registered	15
Pupils taking tuning for the first time	8
	23

Four pupils left during the year. One went home and three were advised to give up the work because of inability to make satisfactory progress.

Five others who took tuning left school in June. Two graduated and the other three have all found employment.

Yours respectfully,

F. S. HARRIS,
Teacher of Tuning.

The Honorable Board of Managers, New York State School for the Blind:

Gentlemen.— I have the honor to submit herewith my annual report for the year 1909–10.

We have had an unusual amount of minor sickness during the year. An epidemic of measles gave us an unusually large number of cases, and it is especially gratifying to note that they all passed through the disease without any fatalities. We have had the usual number of colds and catarrhal lesions, a few more serious cases, but in the main the year has been satisfactory so far as the progress and result of the diseases we have had is concerned.

I desire to note especially the hearty co-operation of the superintendent and matrons in the care of the children at the institution. The sanitary conditions are satisfactory with the exception of the facilities at the hospital. There should be additional facilities provided there for the care of the children who may chance to be ill. There should also be provided in the physician's office a cabinet for the medicines and the few instruments required. At present there is nothing but some out of date cupboards which are too small and are illy arranged for the purpose for which they are intended. There should be a couple of cabinets for the doctor's office and one for the matron's office on the boys' side, of suitable size to contain the remedies and appliances necessary.

We especially appreciate the additional equipment for the hospital which was provided last year, and the wisdom of the superintendent and the Fiscal Supervisor in approving this has been amply demonstrated by the necessity for its use during the past year.

We are at present having some sporadic cases of measles. Each recurring year brings us new pupils and it seems to be a part of the plan for one or two new pupils to bring along enough measles to distribute to those who thus far have not been supplied, so that a part of the training of the pupils as they come here, seems to be the passing through the contagious diseases. These cases are progressing satisfactorily thus far. At present writing we have had nine cases, but we are anticipating no serious results. The institution has provided a competent practical nurse who is giving the nine cases such care as seems to be necessary.

Your physician desires again to renew his frequently presented recommendation that a special nurse be engaged for this institution to be permanently employed to look after the children of the institution.

Respectfully submitted,

J. W. LeSEUR,
Attending Physician.

REPORT OF OPHTHALMIC EXAMINER.

Mr. C. A. Hamilton, *Superintendent, New York State School for the Blind:*

Dear Sir.— During the year 1909–1910 there were twenty-seven new pupils examined, the causes of blindness being as follows:

Ophthalmia neonatorum	6
Optic atrophy	4
Hydrophthalmos	4
Congenital cataract	3
Phlyctenular keratitis	1
Interstitial keratitis	1
Ulcerative keratitis	1
Choroido-retinitis	1
Sympathetic ophthalmia	1
Progressive myopia	1
Irido-cyclitis	1
Cataract	1
Diagnosis unrecorded	2
Total	27

Respectfully submitted,

LORENZO BURROWS, JR.,

Optical Surgeon.

REPORT OF THE STEREOTYPING DEPARTMENT.

Batavia, N. Y., *June* 30, 1910.

Superintendent C. A. Hamilton:

Dear Sir.— I submit record of work done in the stereotyping department between September 1, 1909, and June 30, 1910.

Metal plates stereotyped:

Music, large plates	123
Literary work, small plates	187
Literary work, large plates	856

Pages printed from stereotyped plates:

Music, small pages	223
Music, large pages	2,311
Literary work, small pages	14,164
Literary work, large pages	20,553
Literary work, volumes made	382

Dimensions of large plates, 10½ x 13½ inches.

Dimensions of small plates, 10½ x 7 inches.

A large amount of miscellaneous work has been done that is not recorded in the catalogue, e. g., shellaced music and kindergarten reading matter, parts of books needed for immediate use in the classrooms, and Regents' examination questions.

A new feature of the work this year was the making of point print calendars containing suitable quotations for each month. One hundred and twenty-seven of these calendars were made and sold, more than half of which were sent to people outside of the school.

Orders for music and literary work have been received to the amount of $82.69.

A new map machine has been purchased which has been of material aid in the teaching of geography. As the teachers learn what can be accomplished with this, the demand for maps is increasing.

Respectfully submitted,

JENNIE A. HINSDALE,

Stereotyper.

PIANO AND ORGAN RECITAL BY JOHN ALEXANDER MELDRUM, ASSISTED BY MISS HAZEL L. WILCOX, VIOLIN, THURSDAY EVENING, MARCH THIRTY-FIRST, NINETEEN HUNDRED AND TEN, AT EIGHT O'CLOCK.

PROGRAM.

ORGAN —

a Prelude and Fugue in F. . . . . *Bach*
b. "Little" g minor Fugue. . . . . *Bach*
c. Funeral March, Opus 35. . . . . *Chopin*
d. Concerto in B flat, first movement. . . . . *Handel*

PIANO —

Sonata in c minor, Opus 10, No. 1. . . . . *Beethoven*

VIOLIN —

Concerto in G major, Opus 31. . . . . *Seitz*

Hazel L. Wilcox

PIANO —

a. Nocturne, Opus 23, No. 4. . . . . *Schumann*
b. To Spring, Opus 43, No. 6. . . . . *Grieg*
c. Barcarolle, Opus 30, No. 2. . . . . *Rubinstein*

ORGAN —

a. Christmas Pastorale, Opus 56. . . . . *Merkel*
b. Marche Religieuse, Opus 15. . . . . *Guilmant*

ORGAN RECITAL BY THOMPSON ALEXANDER COURTNEY, ASSISTED BY THE CHOIR AND EARL R. McCARTY, PUPIL, FRIDAY EVENING, JUNE THIRD, NINETEEN HUNDRED TEN, AT EIGHT O'CLOCK.

PROGRAM.

a. Elevation in A flat. . . . . *Guilmant*
b. Postlude in B flat. . . . . *Rinck*

Earl R. McCarty

Toccata and Fugue in d minor. . . . . *Bach*
"But the Lord is Mindful of His Own," from St. Paul. . . . . *Mendelssohn*

Choir.

Sonota in a minor. . . . . *Borowski*
Allegro ma non troppo.
Andante.
Allegro con fuoco.

a. Elevation in E major. . . . . *Saint-Saens*
b. Scherzo in g minor. . . . . *Macfarlane*
c. Temple March in F major. . . . . *Vincent*

"The Lass with a Delicate Air". . . . . *Arne-Fox*

Choir.

Sonata in d minor. . . . . *Lemmens*
Allegro moderato.
Maestoso.

COMMENCEMENT RECITAL AND COMMENCEMENT EXERCISES.

Commencement Recital of the Department of Music of the New York State School for the Blind, Batavia, New York, on the evening of Tuesday, June 7, 1910, in the School Chapel at 8 o'clock.

PROGRAM.

Part I.

String Orchestra —

a. Evening Breeze .... *Lange*
b. Humoreske .... *Dvorak*

First Violins —
Hazel Wilcox,
Hazel Harrison,
August Fricker.

Second Violins —
Harold Owen,
Naldo Gioia.

Third Violins —
Frank Lamb,
James Speed.

Violoncello —
Edward Dewert,
Piano —
Thompson Courtney.

Duet for Two Pianos —
Morceaux Melodieux, No. 3 .... *Gurlitt*
EUGENE MOSES, FRANK CHRISTASTIE.

Songs —
a. "Who Shall be Fleetest?" from Rebekah .... *Barnby*
MARIE GOOLAH AND JUNIOR CHOIR.

b. "Down in the Dewy Dell" .... *Smart*
MARIE GOOLAH, ESTHER DAVIS, VASHTI BALDWIN.

c. "Bridal Chorus" from The Rose-Maiden .... *Cowen*
Accompaniment by MILDRED OWEN.

Violin —
Concerto, Opus 31 .... *Seitz*
Allegro moderato, Andante Cantabile, Allegro.
HAZEL L. WILCOX.
Accompaniment by JOHN A. MELDRUM.

Anthem —
The Lord is My Shepherd .... *Macfarren*
JUNIOR AND SENIOR CHOIRS.
Organ Accompaniment by WILLIAM NOLAN.

Girls' Fire Drill.

Our Kindergarten Department at Play.

PROGRAM.

Part II.

String Quartette —

a. Perpetual Motion .... *Froehlich*
b. Minuett .... *Boccherini*

First Violin — Harold Owen.	*Viola* — James Speed.
Second Violin — Naldo Gioia.	*Violoncello* — Edward Dewert.

Songs —

a. Since First I Saw Your Face .... *Ford*
b. The Lark's Song (Canon) .... *Mendelssohn*
c. Just Like Love .... *Davy-Novello*

Senior Choir.
Accompaniment by Mildred Owen.

Piano —

Humoreske, for two pianos, Opus 47 .... *von Wilm*
Thompson Courtney, Rachel Galinsky.

Chorus —

Ave Maria .... *Gounod-Bach*
Senior Choir.
Accompaniment by String Orchestra.
Thompson Courtney at the piano.

Organ —

Marche Religieuse, Opus 15 .... *Guilmant*
John A. Meldrum.

COMMENCEMENT EXERCISES FOR THE SCHOOL YEAR 1909-1910, WEDNESDAY EVENING, JUNE 8, AT 8 O'CLOCK, IN THE SCHOOL CHAPEL.

PROGRAM.

Orchestra —

Hope March .... *Papini*

First Violins —
Hazel Wilcox,
Hazel Harrison,
August Fricker.

Second Violins —
Harold Owen,
Naldo Gioia.

Third Violins —
Frank Lamb,
James Speed.

Violoncello —
Edward Dewert.

Piano —
John Meldrum.

Oration —
Back to the Farm.
THOMAS A. BEADNELL.

Oration —
Shall We Subsidize Our Merchant Marine?
JESSE D. MCHERRON.

Chorus —
O'er the Meadows Tripped Sweet Kitty.......................... *Smith*
SENIOR CHOIR.
Accompaniment by JOHN MELDRUM.

Historical Sketch —
The Development of the Piano.
ROBERT J. MULLIGAN.

Oration —
Capital Punishment Attacked.
FRANK T. LAMB.

Oration —
Capital Punishment Defended.
WILLIAM J. NOLAN.

Anthem —
"How Lovely Are the Messengers," from St. Paul.......... *Mendelssohn*
SENIOR CHOIR.
Accompaniment by THOMPSON COURTNEY.

Illustrated Account of the Development of the Organ.
THOMPSON COURTNEY.

Oration —
The Japanese Question.
GEORGE W. STONE.

Organ —
March from Tannhauser.................................... *Wagner*
WILLIAM J. NOLAN.

Presentation of Diplomas.
Manager FRANK W. SEVERNE.

COURSES OF STUDY.

The Kindergarten and Connecting Class.

This course requires from two to three years and covers approximately the work done usually in the kindergarten and in grades 1 and 2 of the public schools. Besides this, much attention is given to digital training, games and exercises that will develop normally the powers of a child and to questions of etiquette and manners.

Reading.— New York Point alphabet. Phonic, word and sentence methods. Enunciation and expression. Following books read: Appleton's First and Second Readers; Child Life, a second reader; Robinson Crusoe, a second reader; Wake Robin Series No. 2, containing biographies of Columbus, Washington, Lincoln, Franklin, Froebel, Agassiz, Longfellow, and McKinley.

Spelling.— Words found in reading lessons. Days, months, familiar objects and commonly used words. Use of capitals and the apostrophe; spelling games and rhyming exercises.

Writing.— Letters and simple sentences in New York Point.

Number.— Combination of numbers to 100. Simple addition and subtraction. Multiplication tables of twos, threes and fives. Much drill on the combinations in addition and subtraction. Some drill in oral computation. Romans. Simple measurements and forms.

Language.— Mainly oral reproduction of stories. The making of small sentences. Correct forms of words in common use. Simple lessons in memorizing. Many poems, quotations and memory games.

Manual Training.— Clay and sand modeling, bead work, construction work, cardboard work, weaving, braiding, lacing, paper folding, finger knitting, tying knots.

Miscellaneous.— Lessons on care of body. Nature lessons adapted to the season. Appropriate observation of holidays and birthday anniversaries. Band of Mercy meetings once a week in which are discussed the habits, work and uses of animals, emphasizing our duty toward them in care and treatment, and when possible, allowing the pupils to examine mounted specimens.

Third Grade.

Reading.— Cyr's Second Reader. Appleton's Third Reader. Baldwin's Robinson Crusoe.

Spelling.— Modern Spelling Book to page 149. List of words taken from reading lessons.

Writing.— Point Print copying of proverbs and poems. Attention to neatness and accuracy.

Arithmetic.— Multiplication tables to 12 times 12. Short division, long division begun; tables of time, United States money, lineal, liquid and dry measure; constant application to easy problems; drill for accuracy; begin use of type slate.

Language.— Punctuation marks; capitals; correct forms of commonly used words; oral reproductions of stories; letter writing; memorizing poems and selections.

Geography.— Elementary ideas; points of compass; physiographic forms taught by sand table; oral work on home geography.

Physiology.— Oral lessons on teeth, hair, nails and skeleton; proper position of the body in sitting, standing and walking.

Miscellaneous.— Nature study lessons adapted to the seasons: Proper observation of the anniversaries; current events.

Fourth Grade.

Reading.— Cyr's Third Reader. Appleton's Fourth Reader. Eggleston's American Life and Adventure. Continuous attention to pronunciation and expression.

Spelling.— Modern Spelling Book to page 94. Lists of words selected from other lessons.

Writing.— Same as grade 3.

Arithmetic.— Complete multiplication table to 20 times 20; Roman numerals; cancellation; easy fractions both common and decimal; analysis, drill and review.

Language.— Third grade work continued. Easy compositions, oral and written. Drill on forms. Memorizing well chosen selections.

Geography.— North America, with special work on the United States and New York State. Centers of population and railroad routes. Products and occupations.

Physiology.— The joints, muscles and skin. How, why and what to eat. A few simple facts about digestion.

Miscellaneous.— Same as third grade.

Fifth Grade.

Reading.— Cyr's Fourth Reader, vol. 1. Appleton's Fifth Reader. Old Greek Stories. Constant attention to enunciation and expression.

Spelling.— Modern Spelling Book to page 100, with supplemental lists made by teacher.

Writing.— Daily practice on language and spelling words. Dictation exercises.

Arithmetic.— Common fractions and decimals; aliquot parts; tables and reduction of compound numbers; continue analysis and review as necessary.

Language.— Oral and written reproductions, narratives and descriptions. Drill on proper forms. Review capitals and punctuation. Memorize choice selections.

Geography.— South America and Europe, following outline and teaching important features only.

Physiology.— The blood and circulatory system.

American History.— Biographical sketches following syllabus.

Sixth Grade.

Reading.— Cyr's Fourth Reader, vol. 2. Appleton's Fifth. Lives of Great Americans.

Spelling.— Modern Spelling Book to page 143, with supplemental lists.

Writing.— Same as for fifth grade. Constant care to prevent formation of careless habits.

Arithmetic.— Review common decimal fractions and denominate numbers; begin percentage; practical business problems; much oral work.

Language.— Continue oral and written compositions. Begin technical grammar. Parts of speech and elements of a simple sentence. Memorizing.

Geography.— Asia, Africa and Oceanica studied as in grade five.

Physiology.— Respiration, air, ventilation.

American History.— Same as grade five.

Seventh Grade.

Reading.— Appleton's Sixth Reader: American History Selections. The improved American Braille alphabet should be learned in this grade.

Spelling.— Second part of Modern Speller, with supplemental lists.

Arithmetic.— Continue percentage with application; review as necessary; simple proportion; drill for accuracy; much oral work.

Language.— Inflections. Analysis of sentences. Phrases and clauses. Weekly compositions.

Geography.— Subject reviewed. Special work on United States and New York State. Class prepared for Regents' examination.

Physiology.— Nerves and special senses. Formation of habits.

American History.— Follow outline in syllabus.

Eighth Grade.

Reading.— Selections from books used in English work.

Spelling.— As required by the teacher.

Arithmetic.— General review; and completion of subject; powers and roots; more applications of percentage; practical problems, short methods and accuracy.

Language.— Analysis. Review inflections. Composition work continued. Study books required by Education Department.

Physiology.— General review. Practical Hygiene. Formation of habits.

American History.— Follow outline in syllabus.

Pupils in this grade may study one or more academic subjects if deemed capable of so doing.

Academic Department.

The course of study in this department follows as closely as possible that outlined by the Education Department of the State of New York for the public high schools of the State. Not all of the subjects belonging to each of the four academic years can be given at the same time, but classes in them all will be formed whenever there is sufficient demand to warrant it, and the Regents' academic diploma is required for graduation from the literary department.

Music Department.

The course of music study as designed by the Education Department is also followed in our school, it being especially adapted to our needs, and the Regents' music diploma is required for graduation from this department, or an academic diploma containing at least 31 counts in music including 15 counts for music practice. We append the following from the course in music adopted by the Regents December 21, 1907:

A diploma in music based upon the four year course of study contained herein will be given for the following counts:

Musical instruction (4 years)	20	counts
Musical practice (2 hours per week for a school year equaling a count)	15	"
History (two three hour courses)	6	"
English (4 years)	13	"
1st foreign language (2 years)	10	"
2d foreign language (1 year)	5	"
Drawing (1 year)	3	"
	72	

The 20 counts for musical instruction will be given on passing written examinations as follows:

2 Rudiments of music.
7 Harmony and counterpoint.
3 Musical form and analysis.
4 Ear training and musical dictation.
4 Acoustics and history of music.

The numerals prefixed to the subjects in the above list indicate the number of lessons a week for a year and also the number of counts to be earned thereby.

The 15 counts for musical practice will be given on certificate of the principal of the school.

This course in music is also recognized in the subjects necessary for the academic diploma as follows: A student who meets the "group requirements" for an academic diploma, viz.: English (13 counts), history (8 counts), mathematics (10 counts), science (10 counts), may offer music for the 31 elective counts or any part thereof.

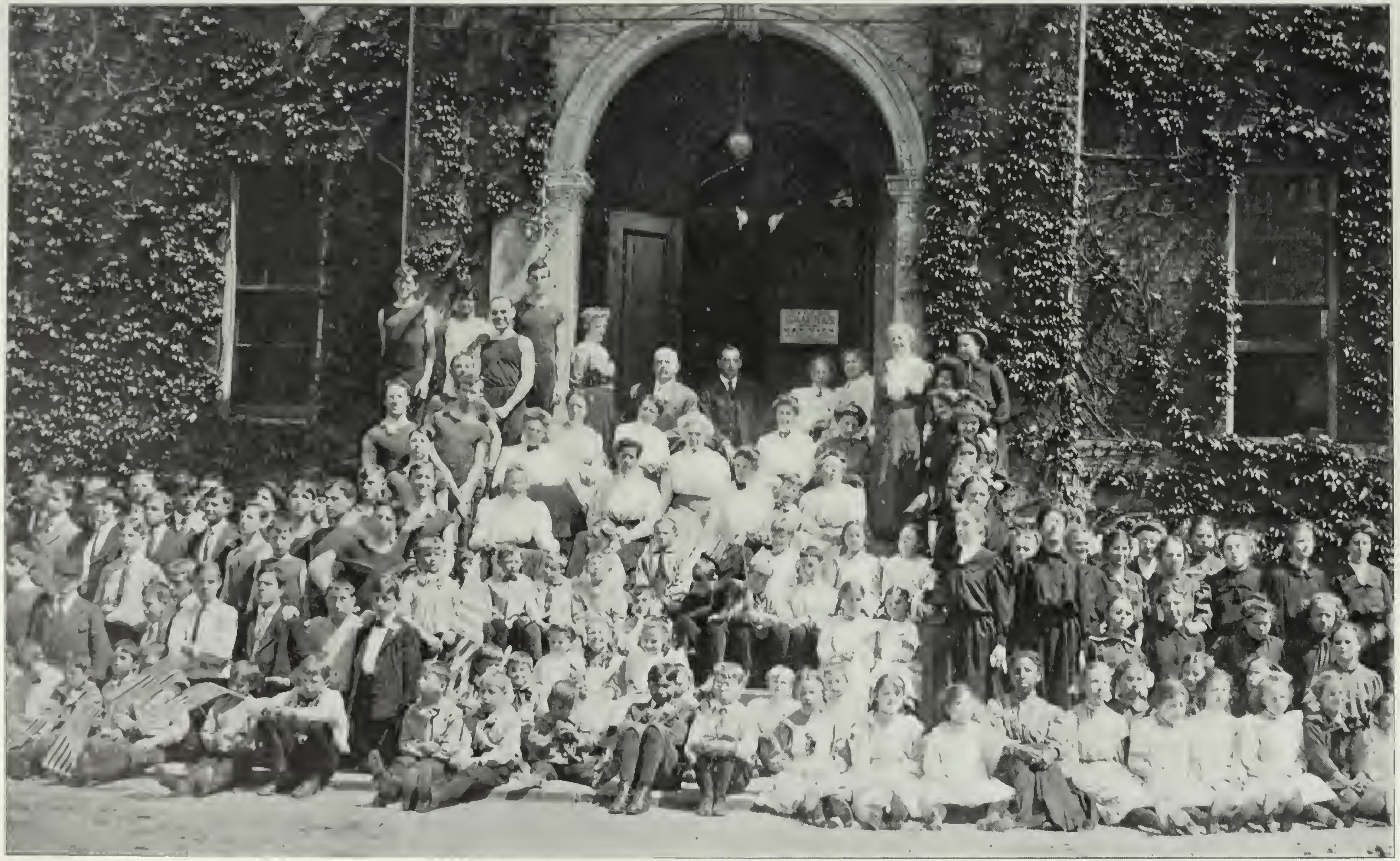
In earning the above diploma in music pupils of our school may substitute other counts for the three assigned to drawing; fifteen counts in one foreign language will also be accepted.

In addition to the instruction in theory, history and form, our music course includes instruction in piano, pipe organ and violin. The work on these instruments is also based on the Regents outline and requires from six to ten years for completion, the time depending upon the pupil's ability and the amount of other school work taken.

Our vocal instruction includes work in classes only, beginning with kindergarten, 25 minutes daily, one part songs.

Junior choir, 50 minutes daily, work in songs, rounds and catches, in two and three parts.

Senior choir, 50 minutes daily, exercises and voice culture and sight reading, composition of both sacred and secular music in four parts carefully studied.



Group Photographed After Memorial Day Sports.

Our Youngest Pupils Starting for Church.

A complete syllabus covering in detail either the work in the academic or music department can be obtained by addressing the Education Department, Albany, N. Y.

Tuning and Industrial Departments.

The Regents preliminary certificate shall be required as a minimum scholastic qualification for graduation from the tuning and industrial departments. This requirement may be waived in exceptional cases by vote of the Board of Managers. A certificate testifying to the work done in these departments shall be given by the superintendent to such persons as complete the technical work required in these courses without earning the preliminary certificate.

Piano Tuning.

First Grade.— The general study of pitch and of musical intervals, and their application as employed in tuning. Study of keyboards and the various arrangements of tuning pins in different styles of upright and square pianos. The uses of the test blow. The proper management of the tuning hammer and setting the tuning pin, in connection with the use of the test blow.

The work of this grade is given for accuracy alone, with only such regard for speed as is necessary for the formation of habits of industry and quick perception.

Second Grade.— Daily practice in tuning unisons and octaves. Structure of the temperament begun. The principles and laws of acoustics explained and exemplified: 1. In the construction of the piano forte. 2. In the application of the phenomena of vibrations, harmonics and beats to the equal temperament of the musical scale within the temperament octave, and to the extension of this equal temperament, by octave tuning and the use of octave proofs, throughout the entire register.

Emphasis is placed upon the necessity for correct observation and reasoning in employing the various methods for making work stay in tune.

Third Grade.— Daily practice in tuning the piano as a whole, on upright, square and grand pianos. Occasional practice in tuning pianos for use in the music department. Action work begun. Simple repairing operations. The several methods of replacing broken strings. The use of nails, screws and rivets in repairing, with or without glue. The use of clamps in glueing. Exercises in the use of the hand drill, file and other wood and metal-working tools upon small articles held in the hand or in the bench vise.

Speed practice in tuning for those preparing to take positions in piano factories.

Fourth Grade.— Short daily practice periods in tuning, in addition to responsibility of assigned work in tuning for the music department, and occasional opportunities for tuning pianos outside the school.

Dismounting, assembling and regulating all kinds of piano actions. The use of various lubricating agents as needed in different parts of the piano and pedal action. Exercises in the correct diagnosis of all defects most commonly met with in ordinary tuning practice, and the requirement of skill in applying the most satisfactory and permanent methods for their adjustment and repair. The use of special tools in tone regulating, capping, etc., and in general, the development of judgment and skill in the treatment of the piano as a medium for artistic expression.

The work of the fourth grade also comprises a full course in cleaning, repairing, regulating and tuning cabinet organs.

The word "grade" as used above, is merely a division of the work to enable us to rate the pupil and mark progress. The length of time required to complete each grade will vary from six months to a year or more, depending upon the age and capacity of the pupil, and the amount of time which he can devote to the work daily.

TEXT-BOOKS USED IN THE SCHOOL.

Mathematics.

Arithmetic: Walsh's Primary; Wentworth's Milne's.

Algebra: Wells.

Geometry: Wells.

Science.

Geography: Tarbell's; Werner's Grammar School; Maury's Physical.

Physiology: Steele's Hygienic Physiology.

Physics: Gage's Introduction to Physical Science and Elements of Physics.

Geology: Tarr's Elementary.

Astronomy: Young's Elements.

Psychology: James'.

Biology: Hunter's Elements.

History and Social Science.

United States: Barnes' Primary and Brief History; McMaster's School History.

English: Montgomery.

Ancient and European: Myer's General.

Civics: Fiske's Civics in United States.

Economics: Ely's Outlines.

Language.

English: Spellers, the Modern Spelling Book; Readers, Appleton's; Cyr's selected books for supplemental work.

Grammar and Literature: Follow syllabus.

German: Harris' Lessons; Thomas' Practical German Grammar.

Latin: Collar & Daniels' Beginners' Latin Book.

Allen & Greenough's Latin Grammar; Jones' Latin Prose Comp.

Business Methods: Teller & Brown.

TABLE I.

LIST OF PUPILS.

BOYS.

Name	Age	Nationality	County	Received
Abrams, Charles	12	American	Orange	1908
Andrews, Chester	12	American	Genesee	1903
Alvany, James	13	Irish	Albany	1909
Armstrong, Mitchell	21	Indian	Franklin	1905
Beadnell, Thomas	21	American	Warren	1900
Beecher, Harry	12	American	Dutchess	1905
Boname, William	19	American	Chenango	1907
Bonner, Daniel	19	American	Cortland	1909
Bordis, Max	19	American	Fulton	1899
Brock, Wallace	8	American	Monroe	1909
Brooks, Harold	9	American	Onondaga	1908
Burke, William J	52	Irish	Wayne	1909
Caldwell, Arthur	16	American	Erie	1900
Caswell, Thornton	17	American	Orange	1898
Christastie, Frank	13	Polish	Chemung	1905
Cline, Jacob	21	American	Broome	1904
Collins, Harold	16	American	Erie	1907
Courtney, Thompson	23	American	Rensselaer	1904
Culver, William	15	American	Erie	1901
Denny, Henry	9	American	St. Lawrence	1905
Desmond, Earl	17	American	Oneida	1905
Dewert, Edward	17	American	Wayne	1898
Dunn, Carlton	16	American	Livingston	1904
Dust, Charles	8	German	Erie	1908
Egan, Clinton	16	American	Jefferson	1908
Easton, William	12	American	Jefferson	1908
Eich, Van Norman	11	German	Erie	1908
Ellenwood, Harris	15	American	Clinton	1908
Evingham, Harold	12	American	Allegany	1905
Ewing, George	17	American	Genesee	1897
Finnegan, Thomas	30	Irish	Erie	1906
Garassi, Angelo	23	Italian	Erie	1897
Gebhardt, John	22	German	Erie	1905
Gebler, William	12	Polish	Erie	1909
Gioia, Naldo	17	Italian	Genesee	1897
Grabowski, Frank	18	Polish	Erie	1908
Guignio, Joseph	18	Italian	Chautauqua	1900

TABLE I — *Continued.*

LIST OF PUPILS — *Continued.*

Name	Age	Nationality	County	Received
Gysel, Lester	12	German	Monroe	1908
Holt, Eugene	20	American	Onondaga	1908
Hutley, Clyde	8	American	Chautauqua	1907
Hutley, Edward	6	American	Chautauqua	1908
Jacoby, Edward	15	Irish	Broome	1905
Jones, Milton	47	American	Oneida	1908
Kennedy, Jacob	15	Indian	Cattaraugus	1906
Knight, Leon	12	American	Livingston	1909
Kraft, Arthur	13	German	Erie	1902
Lamb, Frank	22	American	Broome	1907
La Flame, George	10	French	Oswego	1906
Lemke, Edward	16	American	Onondaga	1902
Marsh, Ora	18	American	Chautauqua	1898
McCarty, Earl	17	American	Oneida	1898
McHerron, Jesse	21	American	Livingston	1898
Meldrum, John	15	American	Erie	1900
Monoghan, Robert	7	American	Monroe	1909
Morris, Richard	12	American	Schenectady	1909
Moses, Eugene	13	American	Warren	1904
Mulligan, Robert	21	Irish	Washington	1900
Nester, John	11	Irish	Oneida	1906
Nolan, William	18	American	Otsego	1905
O'Keefe, Paul	10	Irish	Seneca	1907
O'Rourke, Charles	10	Irish	Schenectady	1909
Owen, Harold	15	American	Genesee	1900
Packard, Ellsworth	15	American	Monroe	1906
Patterson, John	11	Scotch	Niagara	1906
Phillips, Fred	10	Indian	Erie	1909
Priddle, Henry	16	American	Albany	1905
Quinn, George	12	Irish	Saratoga	1909
Redmond, John	9	American	Erie	1908
Relyea, George	12	American	Ulster	1909
Royce, Lewie	18	American	Wyoming	1909
Sager, Floyd	17	American	Erie	1906
Seibert, Byron	8	American	Niagara	1907
Seitz, Joseph	18	German	Erie	1904
Sharrer, Gerald	8	American	Onondaga	1909
Sheehan, James	10	American	Erie	1909
Sherby, Hilliard	13	American	Jefferson	1908

TABLE I — *Continued.*

LIST OF PUPILS — *Continued.*

Name	Age	Nationality	County	Received
Smith, Rupert	40	English	Erie	1909
Speed, Gilbert	15	American	Seneca	1902
Speed, John	18	American	Seneca	1901
Speed, James	19	American	Seneca	1901
Stafford, George	9	American	Chautauqua	1909
Stein, Lawrence	9	German	Monroe	1908
Stone, George	17	American	Dutchess	1909
Sturdevant, G. W	39	American	Oneida	1908
Thurley, Henry	15	American	Monroe	1905
Tiffany, Fred	11	American	Chenango	1905
Vetal, Herbert	5	American	Rensselaer	1909
Walters, Franklin	25	American	Onondaga	1905
Walters, George	15	American	Oneida	1906
Wesp, Arthur	12	German	Erie	1906
Wiers, Harold	14	American	Fulton	1909
Williams, Charles	12	American	Orange	1909

GIRLS.

Name	Age	Nationality	County	Received
Ames, Gladys	10	American	Broome	1909
Baker, Bella	14	American	Monroe	1905
Baldwin, Vashti	12	American	Erie	1907
Bell, Helen	14	American	Orange	1902
Berryann, Orpha	8	American	Ulster	1909
Bowers, Clara	15	American	Oneida	1908
Carlson, Agnes	17	Swede	Wyoming	1909
Constable, Sarah	13	American	Delaware	1907
Cosgrove, Clarissa	8	American	Dutchess	1905
Crosby, Fannie	7	American	Rensselaer	1909
Cutbill, Ida F.	23	American	Westchester	1909
Davis, Esther	11	American	Steuben	1907
Didas, Emma	12	American	Steuben	1906
Dewert, Eva	20	American	Wayne	1898
Ellis, Helen	13	American	Chemung	1907
Ellmore, Elizabeth	12	American	Genesee	1907
Fay, Marjorie	9	American	Chautauqua	1909
Ferrin, Frances	12	Irish	Monroe	1906
French, Gertrude	9	American	Orange	1907
French, Kathleen	16	American	Monroe	1899

TABLE I — *Continued.*

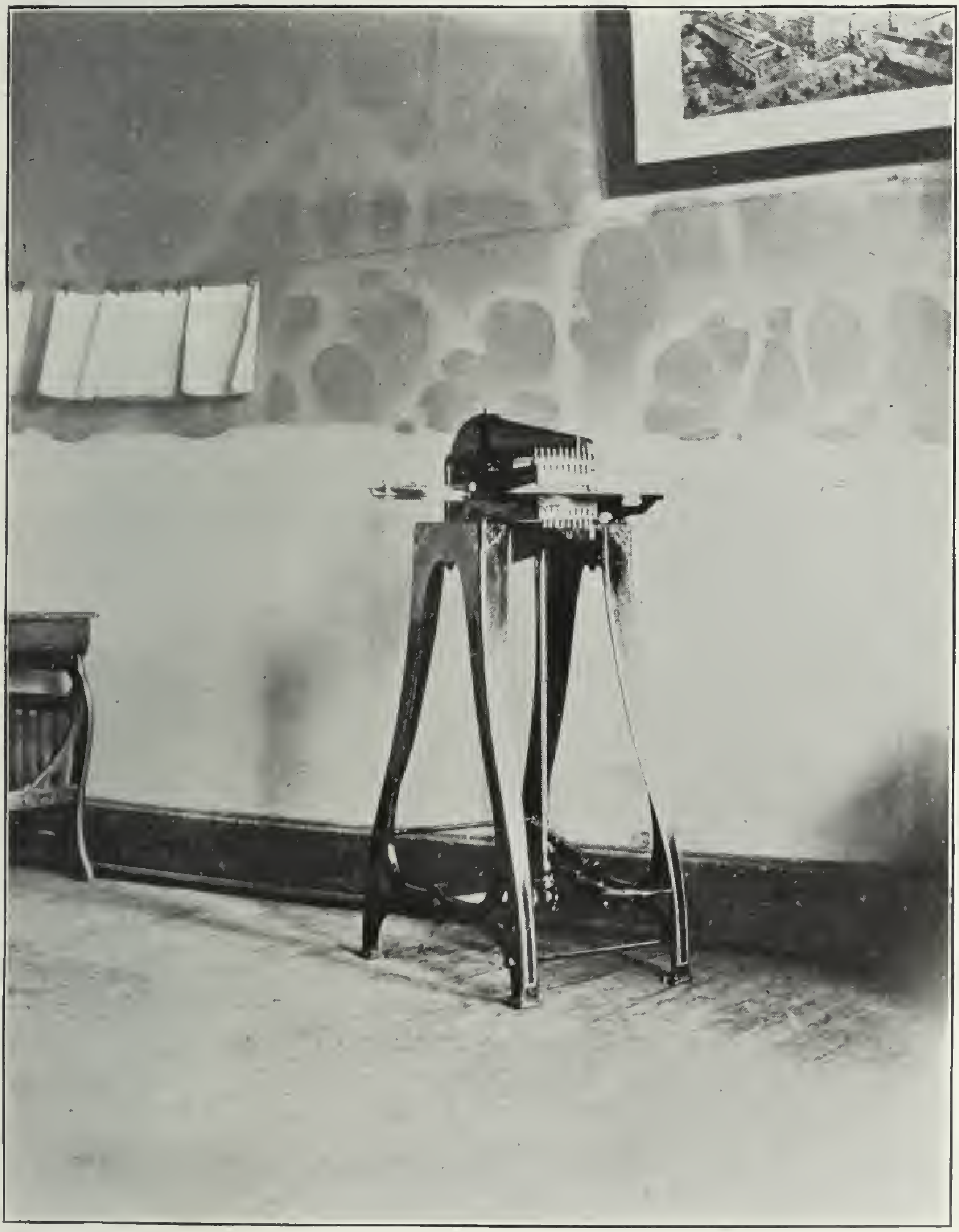
LIST OF PUPILS — *Continued.*

Name	Age	Nationality	County	Received
Galinsky, Rachel	28	Russian	Oneida	1905
Glover, Lillian	7	American	Ontario	1909
Goolah, Marie	11	American	Jefferson	1906
Hamilton, Agnes	10	American	Dutchess	1908
Hammer, Edith	9	American	Orange	1908
Harrison, Hazel	19	American	Fulton	1905
Heinsbury, Georgia	30	American	Onondaga	1885
Hess, Lillian	12	American	Montgomery	1906
Hubbel, Erna J.	9	American	Onondaga	1907
Hutchinson, Phoebe	14	American	Wyoming	1902
Kaufmann, Emma	11	American	Onondaga	1907
Kemp, Bernice	9	American	Madison	1906
Kern, Rosie	11	American	Monroe	1904
Lahr, Violet	11	American	Chemung	1907
Lasher, Edna	15	American	Dutchess	1907
Martin, Eva	15	American	Ontario	1903
Murphy, Dorothy	15	American	Chemung	1909
Myer, Mabel	23	American	Tioga	1900
O'Neil, Anna	16	Irish	Rensselaer	1907
Owen, Mildred	18	American	Genesee	1900
Quatlander, Stella	14	American	Erie	1902
Satterlee, Inez	32	American	Wyoming	1909
Sayles, Jessie	18	American	Washington	1899
Skipworth, Anna	13	Irish	Erie	1905
Smith, Mabel	19	American	Broome	1905
Stafford, Mary	26	American	Chenango	1891
Steig, Hulda	20	American	Niagara	1902
Steinke, Florence	10	German	Erie	1908
Taft, Jennie	21	American	Ontario	1896
Vincent, Lou	15	American	Genesee	1902
Wagner, Clara	19	American	Monroe	1900
Walsh, Marguerite	13	Irish	Erie	1905
Welch, Catherine	7	Irish	Schenectady	1909
Welch, Melvina	13	American	Livingston	1909
Wilcox, Hazel	16	American	Genesee	1903
Wilkins, Jennie	27	American	Fulton	1898
Worden, Genevieve	23	American	Saratoga	1903
Wright, Bertha	19	American	Genesee	1901
Wright, Iva	15	American	Tioga	1903

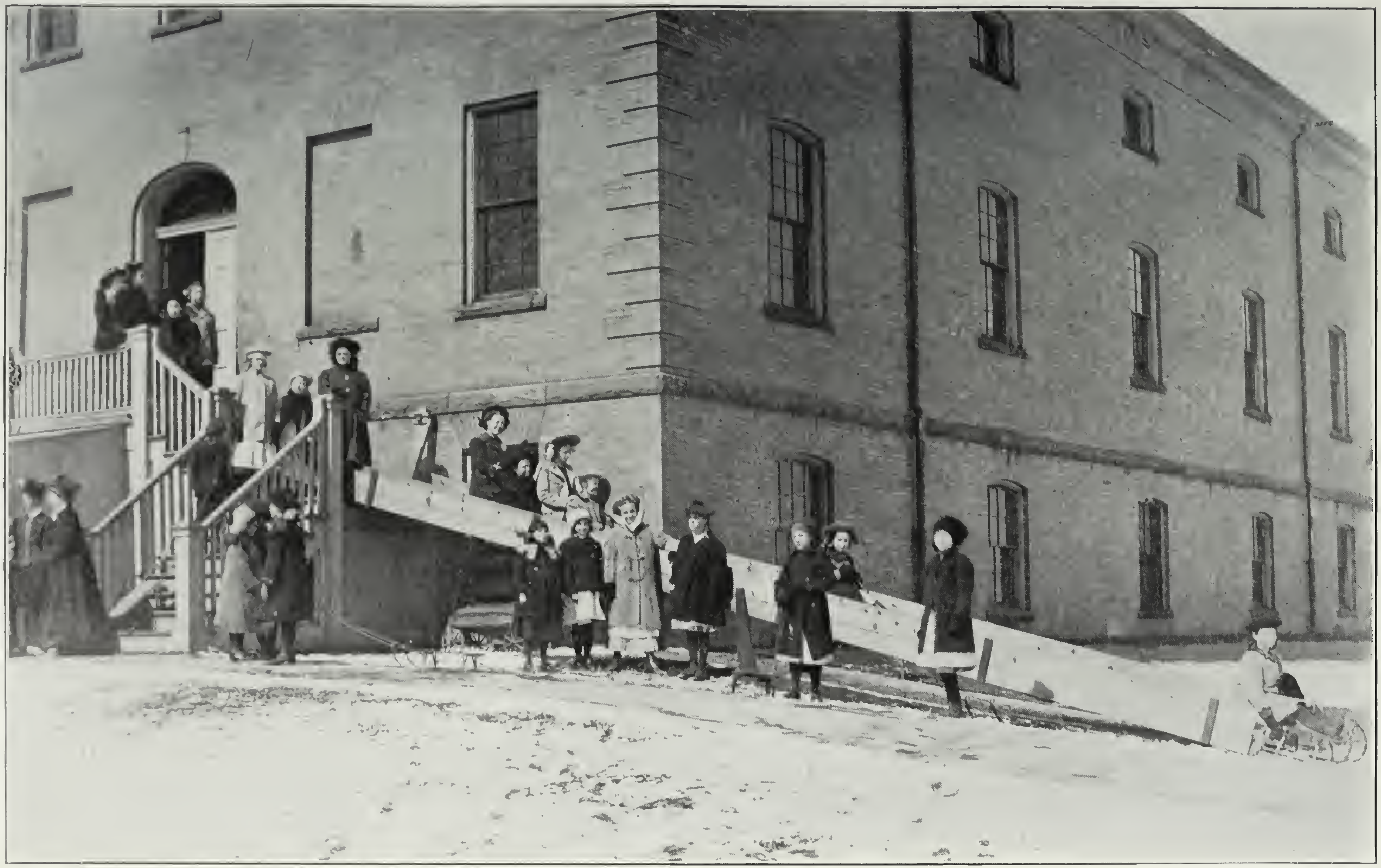
TABLE I — *Continued.*

REGISTRATION BY COUNTIES.

County	Boys	Girls	Totals
Albany	2	......	2
Allegany	1	......	1
Broome	3	2	5
Cattaraugus	1	......	1
Chautauqua	5	1	6
Chemung	1	3	4
Chenango	2	1	3
Clinton	1	......	1
Cortland	1	......	1
Delaware	....	1	1
Dutchess	2	3	5
Erie	18	5	23
Franklin	1	......	1
Fulton	2	2	4
Genesee	4	5	9
Jefferson	3	1	4
Livingston	3	1	4
Madison	....	1	1
Monroe	6	5	11
Montgomery	....	1	1
Niagara	2	1	3
Oneida	6	2	8
Onondaga	6	3	9
Ontario	....	3	3
Orange	3	3	6
Oswego	1	......	1
Otsego	1	......	1
Rensselaer	2	2	4
Saratoga	1	1	2
Schenectady	3	1	4
Seneca	4	......	4
St. Lawrence	1	......	1
Steuben	....	2	2
Tioga	....	2	2
Ulster	1	1	2



Map-Making Machine.



Girls' Toboggan-Slide.

TABLE I — *Continued.*

County	Boys	Girls	Tota
Warren	2	......	2
Washington	1	1	2
Wayne	2	1	3
Westchester	....	1	1
Wyoming	1	3	4
	93	59	152

TABLE II.

TABLE SHOWING THE REGISTRATION OF GIRLS AND BOYS SEPARATELY, THE TOTAL REGISTRATION AND THE NUMBER OF PUPILS REGISTERED FOR THE FIRST TIME.

Registration.

	1906.	1907.	1908.	1909.	1910.
Girls	64	70	63	63	59
Boys	93	82	89	89	93
Total registration	157	152	152	152	152

Number Pupils Registered for First Time.

	1906.	1907.	1908.	1909.	1910.
Girls	7	15	14	7	8
Boys	15	10	16	12	19
Total	22	25	30	19	27

TABLE III.

STATEMENT OF ATTENDANCE FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1910.

Number of inmates in this Institution October 1, 1909.	129
Number of inmates admitted during the last fiscal year	45
Number of inmates discharged or died during the last fiscal year	37
Number of inmates in this Institution October 1, 1910	137
Average population for the last fiscal year ending September 30, 1910	99.47

TABLE IV.

TABLE SHOWING FOR THE LAST SEVEN YEARS THE REGISTRATION, NUMBER OF DAYS SCHOOL WAS IN SESSION, AGGREGATE ATTENDANCE, AVERAGE ATTENDANCE ON THE BASIS OF THE NUMBER OF DAYS SCHOOL WAS IN SESSION, AND ON THE BASIS OF 365 DAYS, TOTAL EXPENDITURES FOR GENERAL MAINTENANCE PURPOSES, AND THE PER CAPITA COST ON THE BASIS OF (a) REGISTRATION, (b) AVERAGE ATTENDANCE ON THE BASIS OF NUMBER OF DAYS SCHOOL WAS IN SESSION, (c) AVERAGE ATTENDANCE ON BASIS OF 365 DAYS.

TWELVE MONTHS ENDING SEPTEMBER 30.	Registration.	Number days in session.	Aggregate attendance.	Average attendance on basis of number days school.	Average attendance on basis of 365 days.	Total expenditures for general maintenance.	Per capita cost on basis of registration.	Per capita cost on basis number days school.	Per capita cost on basis of 365 days.
1904	149	254	32,372	127.448	88.69	$39,395 30	$264 39	$309 10	$444 19
1905	148	172	23,248	136.750	63.69	38,498 21	260 12	281 52	*604 46
1906	157	225	33,332	148.142	91.32	39,982 74	254 66	269 89	†437 84
1907	152	276	36,392	131.855	99.70	41,812 52	275 08	317 12	419 38
1908	152	276	35,990	130.40	98.33	41,515 97	292 87	341 38	452 72
1909	152	276	37,067	134.30	101.55	43,897 39	288 79	326 86	432 27
1910	152	270	36,306	134.44	99.47	45,638 60	300 25	339 39	458 82

* The per capita for 1905 reckoned on the basis of 365 days is excessively high because, on account of the erection of a new power house and laundry building during the summer and fall of 1904, school was not opened until January 3, 1905. This reduced the aggregate attendance by nearly 10,000 days, hence the average attendance based on 365 days was unusually low — about 25 less than usual.

† This per capita would have been considerably lower had we been able to open school on time. On account of the renewing of the plumbing throughout the main building we were unable to open school until November 8, 1905, seven weeks after we were advertised to open.

TABLE V.

TABULATED STATEMENT OF EXPENDITURES UNDER GENERAL MAINTENANCE FUND FROM OCTOBER, 1900 TO SEPTEMBER 30, 1910, INCLUSIVE.

(Fiscal year closes September 30 of each year.)

	1900-01.	1901-02.	1902-03.	1903-04.	1904-05.	1905-06.	1906-07.	1907-08.	1908-09.	1909-10.
Salaries and wages	$23,922 27	$24,672 00	$23,818 71	$22,752 35	$24,289 08	$24,130 59	$24,766 21	$26,276 75	$26,824 17	$26,574 45
Expenses of managers	236 16	343 24	336 48	462 86	479 24	465 48	616 28	798 86	747 20	1,221 30
Provisions	7,027 01	7,272 04	7,187 18	6,699 18	5,668 99	6,762 69	7,222 13	7,628 99	7,426 18	8,347 13
Household stores	355 75	520 13	805 36	700 26	645 79	751 25	636 46	663 94	548 22	786 39
Clothing	501 88	611 60	723 76	739 27	652 25	840 99	676 33	614 56	716 01	669 77
Fuel and light	3,483 22	3,707 59	4,174 12	4,971 30	4,131 60	3,832 21	4,795 32	4,449 36	4,158 90	3,493 30
Hospital and medical	175 58	191 45	212 59	236 89	213 36	132 87	114 67	242 87	175 27	246 83
Shop, farm and garden	1,110 17	1,125 97	1,278 83	1,180 61	931 16	975 42	954 54	1,311 41	1,293 60	2,253 54
Ordinary repairs	41 36	22 07	131 35	90 06	92 47	158 50	18 82	15 64	....	9 00
Transportation of pupils	136 09	178 32	172 70	143 27	109 65	185 07	201 56	239 62	108 13	169 79
Miscellaneous	1,279 96	1,486 40	1,361 26	1,419 25	1,284 62	1,747 67	1,810 20	2,273 97	1,899 71	1,867 10
Total	$38,269 45	$40,130 81	$40,202 34	$39,395 30	$38,498 21	$39,982 74	$41,812 52	$44,515 97	$43,897 39	$45,638 60

TABLE VI.

Statement of the Condition of Special Funds, November 15, 1909.

Chapter 461, Laws of 1909:		
Icehouse, " C." appropriation		$2,600 00
Reappropriated.		
Chapter 461, Laws of 1909:		
Barn, " D," appropriation		$3,000 00
Amount of estimates approved		2,985 46
Balance available		$14 54
Chapter 461, Laws of 1909:		
Books and Apparatus " F," appropriation		$500 00
Amount of estimates approved		463 79
Balance available		$36 21
Chapter 461, Laws of 1909:		
Repairs and Equipment " G," appropriation		$2,000 00
Amount of estimates approved	$2.226 28	
Amount of credit estimates approved	245 30	
		1,980 98
Balance available		$19 02
Chapter 433, Laws of 1909:		
Repairs to Sewer " H," appropriation		$371 96
Amount of estimates approved		12 35
Balance available		$359 61

Chapter 433, Laws of 1909:

Laundry Equipment "J," appropriation		$229 77
Balance available		$229 77

Chapter 508, Laws of 1910:

Painting "A.A.," appropriation		$1,500 00
Amount of estimates approved		1,112 23
Balance available		$387 77

Chapter 508, Laws of 1910:

New Piano "B.B.," appropriation		$450 00
Balance available		$450 00

Chapter 508, Laws of 1910:

Repairs and Equipment "C.C.," appropriation		$1,500 00
Amount of estimates approved	$851 33	
Amount of credit estimates approved	1 60	
		849 73
Balance available		$650 27

Chapter 513, Laws of 1910:

Refrigerator Plant, "F.F.," appropriation		$2,000 00
Balance available		$2,000 00

Chapter 513, Laws of 1910:

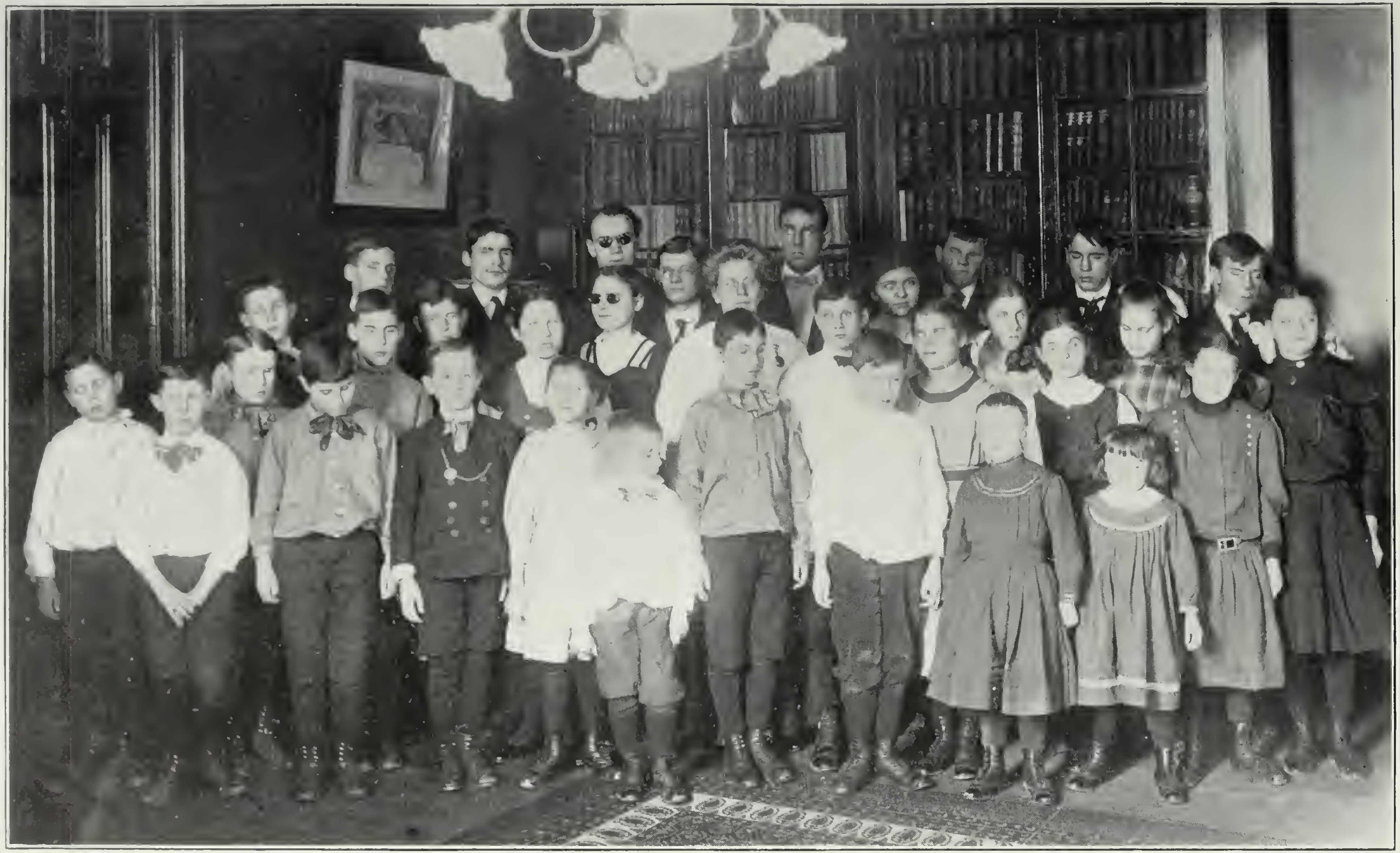
Typewriters "G.G.," appropriation		$600 00
Amount of estimates approved		600 00
Balance available		0 00

TABLE VII.

HOME PRODUCTS FROM FARM AND GARDEN.

	Value
Apples, 42 bushels	$63 00
Apples, crab, 2 bushels	1 00
Asparagus, 49 bunches	4 90
Beets, 31 bushels	15 50
Beans, string, 5¼ bushels	5 25
Cherries, 96 quarts	9 60
Cider, 48 gallons	7 20
Corn, popping, 9 bushels	9 00
Corn, sweet, 140 dozens	14 00
Corn stalks	3 00
Celery, 3,730 bunches	186 50
Cabbage, 840 heads	42 00
Cauliflower, 197 heads	11 82
Carrots, 52 bushels	26 00
Cucumbers, late, 564	5 64
Grapes, 168 lbs.	6 72
Greens, 12½ bushels	6 25
Hay, timothy, 23 tons	345 00
Lettuce, 427 heads	30 10
Onions, early, 83 bunches	8 30
Onions, late, 37¼ bushels	30 55
Parsnips, 14 bushels	7 00
Peas, green, 7¼ bushels	7 25
Peppers, green, 10 dozen	2 50
Potatoes, early, 81 bushels	60 75
Potatoes, late, 191 bushels	76 40
Quinces, 13 bushels	7 80
Radishes, 39 bunches	3 90
Rhubarb, 21¾ bushels	10 88
Salsify, 10 bushels	5 00
Squash, winter, 1,950 lbs.	19 50
Tomatoes, 67½ bushels	40 50
Turnips, 15 bushels	7 50
Total	$1,080 31

The Fourth Generation of Blindness.



All Needlessly Blind Through Ophthalmia Neonatorum.

CATALOG OF NEW YORK POINT MUSIC.
COMPLETE TO JUNE 30, 1910.

TABLE VIII.

Catalog of Tangible Music in the New York Point System, Stereotyped and Printed in the New York State School for the Blind, Batavia, N. Y., from September 1, 1902, to July 1, 1909.

AUTHOR.	Title.	Publisher.	Price.
	Piano.		
Adams, Mrs. Crosby	Five-tone Sketches for Beginners, Op. 1	Summy & Co	.20
Adams	Primary Tone Pictures, Nos. 1, 4, 7, 9	Summy & Co	.04
Adams, Mrs. Crosby	Shepherd's Song, Op. 3, No. 1	Summy & Co	.07
Aldrich	Children's Pieces	Summy & Co	.19
Ambrose	The Hunter's Horn	Silver, Burdett & Co.	.04
Ambrose	The Slumber Song	Silver, Burdett & Co.	.04
Bach	Inventions in three parts, Nos. 1, 2, 3, 4, 6, 7, 9, 14 and 15 (Peters' edition)	Schirmer	.61
Bach	Prelude No. 20 in A minor (Peters' edition)	Schuberth	.07
Bach	Solfegietto in C minor	Schirmer	.13
Beethoven	Sonata, Op. 10, No. 1 (Steingraeber)	Schuberth	.49
Beethoven	Sonata, Op. 10, No. 2 (Steingraeber)	Schuberth	.46
Beethoven	Sonata, Op. 27, No. 2 (Steingraeber)	Schuberth	.43
Beethoven	Sonata, Op. 31, No. 2 (Steingraeber)	Schuberth	.58
Brahms	Waltzes (first twelve) from Selected Works for Piano, Op. 39	Augener & Co	.34
Chittenden	By the Fireside	Silver, Burdett & Co.	.04
Chittenden	Five-note melodies	Silver, Burdett & Co.	.28
Chittenden	Frolic in the Hayloft	Silver, Burdett & Co	.04
Chopin	Nocturne, Op. 15, No. 3 (Kullak)	Schirmer	.16
Chopin	Prelude	Schirmer	.04
Chopin	Waltz, Op. 34, No. 3 (Kullak)	Schirmer	.10
Clementi	Gradus ad Parnassum, No. 3, (Tausig)	Schirmer.	.10
Czerny	Etude, No. 636, Book II, No. 10 (Buonamici)	Schirmer	.04
Czerny	Etude, Op. 636, Book II, No. 10 (Buonamici)	Schirmer	.07
David-Liszt	Romanza	Silver, Burdett & Co.	.07
Davies	In the Moonlight, Op. 107 No. 36	Summy & Co.	.07
Deyo	Revery, Op. 28, No. 3	Luckhardt & Belder	.07
Doehler	A Reminiscence (Chittenden)	Silver, Burdett & Co.	.07
Duble	Salute to Williamsport (two-step)	Vandersloot Music Co	.07
Dubois	Scherzo et Choral, Op. 18 (Oesterle)	Schirmer	.28
Durand	Chacone	Ditson	.07
Duvernoy	Feu Roulant, Op. 256 (for two pianos)	Hofmeister	.22
Field	Nocturne	Schirmer	.13
Godard	Guirlandes, Op. 107, No. 11 (Oesterle)	Schirmer	.13
Grant-Schaefer	At Sundown	Summy & Co	.07
Grant-Schaefer	The Clover Field	Summy & Co	.10
Grieg	Elfin Dance, Op. 12, No. 4, from Half Hours with Best Composers	Millet	.04
Grieg	Morning Mood, Op. 46, No. 1 (Oesterle)	Schirmer	.10
Grieg	Notturno, Op. 54, No. 4 (Oesterle)	Schirmer	.13
Grieg	Poetic Tone Pictures, Op. 3, No. 5 (Peters)	Ditson	.07
Grieg	Watchman's Song, Op. 12, No. 3	Schirmer	.07
Gurlitt	Evensong, Op. 117, No. 20, from "The First Lessons at the Piano"	Schirmer	.04
Gurlitt	Morceaux Melodieux, Op. 174, No. 1	P. Grossman's Sons	.10
Gurlitt	Scherzo, Op. 101, No. 16, from "Album Leaves for the Young"	Schirmer	.05
Gurlitt	Six Bagatelles for the Piano	Bosworth & Co	.22
Gurlitt	Song, Op 172, No. 1	Schmidt	.04
Gurlitt	Trinklied (Drinking Song)	Schmidt	.04
Gurlitt	Valse Noble, Op. 101, No. 14, from "Album Leaves for the Young"	Schirmer	.05
Gurlitt	Waltz, Op. 101, No. 11, from "Album Leaves for the Young"	Schirmer	.05
Gurlitt	Wiegenliedchen (Lullaby)	Schmidt	.04
Hangauer	The Sultana (two-step)	Ingram Music Co	.07
Haydn	Aus der Serenade (duet), from "The Young Pianist," No. 1	Bosworth & Co	.10
Haydn	Sonata in E minor	Schirmer	.25
Heller	Album, Dedicated to the Young, Nos. 1, 2, 3, 4, 5, 7, 10, 14, 15, 17, 18, 19, 20, 22, 23, 24	Pond & Co	.85
Heller	Etude, Op. 47, No. 16	Pond & Co	.04
Heller	Etude, Op. 47, No. 19	Pond & Co	.07
Heller	Etude, Op. 47, No. 21	Pond & Co	.07

TABLE VIII — (*Continued*).

AUTHOR.	Title.	Publisher.	Price.
	PIANO — (*Continued*).		
Heller	Il Penseroso (Chittenden)	Silver, Burdett & Co.	.07
Heller	Twenty-five Melodious Studies, Op. 45, Book II, No. 11	Schirmer	.07
Heller	Twenty-five Melodious Studies, Op. 45, No. 15	Schirmer	.07
Henselt	If I were a Bird, Op. 2, No. 6	Silver, Burdett & Co.	.16
Henselt	Petite Romance	Schirmer	.04
Hollaender	Spring Song, Op. 3, No. 1	J. H. Schroeder	.10
King	Zenobie, two-step	Fiest	.10
Koelling	The Skylark's Morning Song, Op. 169	S. T. Jordan & Son	.10
Kullak	Dance on the Lawn, Op. 62, No. 6 (Klauser)	Schirmer	.07
Kullak	From Flower to Flower, Op. 48	Schirmer	.07
Kullak	Method of Octaves, Part II, No. 2	Schirmer	.13
Kullak	Method of Octaves, Part II, No. 5	Schirmer	.14
Kullak	The Grande Parade, Op. 62, No. 8, from "Studies in Phrasing," Introduction (Mathews)	Presser	.07
Lack	Song of the Brook, Op. 92	Schuberth.	.10
Lincoln	A Southern Dream (waltz)	Vandersloot Music Co	.13
Liszt	Hungarian Rhapsodie, No. 11	Schirmer	.19
MacDowell	Erzahlung (A Tale)	Hainauer	.13
MacDowell	From a Wandering Iceberg, Op. 55, No. 2, from "Sea Pieces"	Schmidt	.07
MacDowell	Intermezzo	Schuberth	.07
MacDowell	Polonaise, Op. 46, No. 12	Brietkopf & Haertel	.16
MacDowell	Sechs Gedichte nach Heinrich Heine	Hainauer	.10
Martin	Love's Reverie (waltzes)	Brehm Bros	.10
Martin, Margaret R.	Melody Pictures	John Church Co	.64
Matthews	Standard Graded Course of Studies (One volume only).	Presser	2.18
Mayer	Butterflies	Silver, Burdett & Co.	.07
Mayer	Harp Sounds	Silver, Burdett & Co.	.07
Mayer	Tarantella, Op. 140, No. 13	Schirmer	.10
Merkel	The Children's March, Op. 30, No. 1, from "Studies in Phrasing," Introduction (Mathews)	Presser	.05
Merkel	The Jolly Huntsman, Op. 31, No. 2, from "Studies in Phrasing," Introduction (Mathews)	Presser	.05
Moszkowski	Waltz Brilliant (Mason)	Schuberth	.22
Mozart	Three Sketches (Chittenden)	Silver, Burdett & Co.	.10
Mozart	Sonata No. 4, in F (Lebert-Cotta)	Schirmer	.25
Neidlinger	The Minuet of the Disobedient Fairies	Schirmer	.04
Nevin	Water Nymph, Op. 13, No. 2	Schirmer	.10
Nicode	Melody in D	Silver, Burdett & Co.	.07
Pauer	La Cascade, Op. 37	Schirmer	.22
Poldini	Marche Mignonne, Op. 15, No. 2	Schirmer	.13
Raff	Tarantella (duet)	Schirmer	.25
Rachmaninoff	Prelude, Op. 3, No. 2 (Oesterle)	Schirmer	.13
Rubinstein	Barcarolle, Op. 30, No. 1	Schirmer	.16
Rubinstein	Melodie in F, from "Piano Classics by Best Composers"	Ditson	.10
Rubinstein	Nocturne, Op. 75, No. 8	Schirmer	.13
Saint-Saens	Le Cygne (The Swan)	Schirmer	.07
Scarlatti	Pastorale in F	Rieter-Biedermann	.07
Schubert	Marche Militaire, No. 1 (duet), Op. 51	Schott's Sons	.13
Schubert	Hark, Hark, the Lark	Schirmer	.22
Schubert	Scherzo, No. 1 (Chittenden)	Silver, Burdett & Co.	.10
Schumann	Des Abends (At Evening), from Fantasiestuecke, Op. 12 (Steingraeber)	Schuberth	.10
Schumann	Traumes Wirren (Steingraeber)	Schuberth	.16
Schumann	Faschingsschwank Aus Wien, Scenes de Carnaval, Op. 26 (Steingraeber)	Schuberth	.40
Schumann	Nocturne No. 4 in F. major	Schirmer	.10
Seeboeck	A Quiet Rainy Morning, Op. 181, No. 1	Schmidt	.07
Seeboeck	Blind Man's Buff, Op. 182, No. 2	Summy & Co	.04
Seeboeck	Leap Frog, Op. 182, No. 5	Summy & Co	.04
Seeboeck	The Dancing School, Op. 161, No. 5	Summy & Co	.04
Seeling	Song of the Rushes, Op. 11, No. 3 (Parsons)	Silver, Burdett & Co.	.13
Spindler	Light Staccato, Op. 221, No. 2	Schirmer	.07
Stamaty	A Singing Lesson	Silver, Burdett & Co.	.04
Stamaty	Fanfare	Silver, Burdett & Co.	.07
Stamaty	The Violoncello	Silver, Burdett & Co.	.07
Stamaty	Trumpet Duet	Silver, Burdett & Co.	.07
Swartz	Bird Echoes	Summy & Co	.22

TABLE VIII — (*Continued*).

AUTHOR.	Title.	Publisher.	Price.
	Piano — *Continued*).		
Swift	The Bogie-Man	Schirmer	$0.04
Tschaikowsky	Berceuse, Op. 72, No. 2	Schirmer	.13
Tschaikowsky	Kinder Album, Op. 39, Book IV (Vogrich)	Rahter	.25
Tschaikowsky	Nocturne, Op. 19, No. 4, from "Album of Songs for Piano"	Luckhardt & Belder	.10
Tschaikowsky	The Skylark	Presser	.05
Tschaikowsky	Theme with Variations, Op. 19	Forberg	.37
Von Wilm	Humoreske (for two pianos)	Ries & Erler	.22
Von Wilm	Neckereien, Op. 12, No. 5	Schirmer	.05
	Organ.		
Bach	Prelude and Fugue in E minor, Book 3, No. 10	Peters	.13
Batiste	Communion in G, Op. 4, No. 1, from "Church and Concert Organist," Vol. 1 (Eddy)	Schuberth	.10
Berlioz	Hungarian March (Rakoczy)	Schott & Co	.16
Borowski	First Sonata	Laudy & Co	.43
Guilmant	First Sonata in D minor, Op. 42 (Warren)	Schirmer	.76
Guilmant	Marche Funebre et Chant Seraphique	Schirmer	.31
MacFarlane	Scherzo in G minor	Schirmer	.10
Mendelssohn	Nottorno, Op. 61	Schirmer	.19
Mendelssohn	Wedding March	Schirmer	.13
Merkel	Canon in F Sharp, Op. 39, No. 3, from "Church and Concert Organist," Vol. I (Eddy)	Schuberth	.07
Rink	Practical Organ School, Part 2, Nos. 67–132, inclusive	Novello, Ewer & Co	.22
Vincent	The Temple March from Organists' Journal, Vol. 7, No. 5	Ashmall	.13
Wagner	March and Chorus from "Tannhauser" (Bartlett)	Schirmer	.22
Wolstenholme	Cantilene	Schirmer	.13
Wolstenholme	The Question and the Answer	Schirmer	.19
	Gems for the Organ (Jackson), Nos. 1–19, 40 and 43	Schirmer	1.03
	Violin.		
Accolay	Concerto in A minor (violin and piano)	Schott & Co	.31
Allen	Doushka, Op. 28	Schmidt	.07
Allen	Introduction and Polonaise, Op. 7, No. 1 (violin and piano)	Schmidt	.13
Allen	Introduction and Gavotte, Op. 10	Schmidt	.10
Allen	Pastorale	Schmidt	.04
Allen	Petit Bolero, Op. 17	Schmidt	.07
Allen	Waltz Among the Flowers, Op. 16, No. 3	Schmidt	.04
Ambrosio	Canzonetta, Op. 6 (violin and piano)	Schirmer	.13
Bach	Air on the G string (violin and piano)	Fischer	.10
Bach	Sarabande (first violin)	Johann Andree	.04
Beazley	Mayday (from 18 Original Melodies)	Fischer	.04
Bloch	Berceuse (from 15 pieces in first position)	Schirmer	.04
Bohm	Cavatina, Op. 314, No. 2	Schirmer	.07
Bohm	Pompa di Festa (Piano accompaniment only)	Simrock	.07
Bohm	Spanische Stanchen	N. Simrock	.04
Bohm	Sarabande	Fischer	.07
Borowski	Adoration (piano accompaniment only)	H. B. Stevens	.10
Borowski	L'Adieu	Schmidt	.04
Busch	Indian Air	Ditson	.04
Campioini	Minuette Pastorale (first violin)	Johann Andree	.04
Case	An Italian Serenade	Schirmer	.07
Danbe	Yankee Doodle, with variations, Op. 21	Schott's Sons	.07
Dancla	Cavatina, Op. 187, No. 1	Fischer	.07
Dancla	Der Freischuetz, Op. 86, No. 2	Fischer	.07
Dancla	Petite Nocturne, Op. 187, No. 5	Fischer	.07
Dancla	Sixth Air Variation	Howe & Co	.07
Drdla	Serenade	Schirmer	.07
Dvorak	Humoreske, Op. 101, No. 7	Simrock	.04
Field	Nocturne from "Violin Classics" (Mittell), Vol. 1, (piano accompaniment only)	Schirmer	.05
Gabriel-Marie	La Cinquantaine (Air in the Olden style)	Fischer	.04
Gillett	Au Moulin (In the Mill) (Violin and piano accompaniment)	Fischer	.10
Gillet	Douce Caresse	Schirmer	.10
Grieg	At the Cradle, Op. 68, No. 5	Fischer	.04

TABLE VIII — (*Continued*).

AUTHOR.	Title.	Publisher.	Price.
	Violin—(*Continued.*)		
Hermann	Five Easy Pieces, Op. 4	Schirmer	$0.07
Hermann	Mignonne-Gavotte, Op. 61	Schott & Co.	.13
Hollaender	Am Bache, Op. 61, No. 2	Schuberth	.07
Hubay	Hajre Kati	Hainauer	.22
Hussla	Barcarole, Op. 8, No. 3	Schirmer	.04
Koehler	Gypsy Melody, Op. 160, No. 3 (violin and piano)	Schirmer	.07
Koepping	Berceuse in D	Schirmer	.04
Kreutzer	Concerto in D minor	Ditson	.22
Lalo	Serenade, Op. 14, No. 2, (violin and piano)	Meser	.07
Mendelssohn	" Thaeler Weit, O Hochen," from Album for four part violin playing, Book 2	Andrée	.07
Meyer-Helmund-Sitt	Maschka (violin and piano)	B. F. Wood Music Co.	.07
Moret	Petite Symphonie, Op. 74 (Accompaniment only)	Schott & Co	.10
Mozart	Serenade (first violin) from a small work for quintette	Brietkopf & Haertel.	.19
Musso	Elegie	B. F.Woods Music Co	.04
Palaschke	Spanischer Tanz, Op. 28, No. 2	Rahter	.04
Papini	Cinderella March (accompaniment only)	Schmidt	.16
Papini	No. 1, Fantasia-Mignonne, Op. 77, No. 1	Chanot & Sons	.13
Papini	Hope March (violin and piano)	Chanot & Sons	.13
Papini	The Sleeping Princess, Op. 101, No. 5 (violin and piano)	H. B. Stevens	.07
Raff	The Mill (second violin), Op. 192, No. 2	Fischer	.07
Rheinberger	Rhapsodie (Violin and organ)	Schirmer	.07
Schubert	The Bee, Op. 13, No. 9 (violin and piano)	Fischer	.13
Schubert	Serenade (Through the Leaves) (piano accompaniment only)	Fischer	.07
Schumann	Garden Melody	Bote & Back	.10
Schumann	Traeumerei, Op. 15, No. 7 (violin and organ).	Schirmer	.07
Seybold	Fluechtige Zert, Op. 117, No. 3	Simrock	.07
Singlee	Fantaisie Pastorale, Op. 56	Fischer	.13
Simonnetti	Madrigal	Schirmer	.04
Thome	Simple Aveu, Op. 25 (Cello and piano)	Schirmer	.10
Vieuxtemps	Reverie, Op. 22, No. 3 (violin and piano accompaniment)	Fischer	.16
Wagner	The Evening Star (organ accompaniment only)	Fischer	.13
	Vocal.		
Aldrich	*Serenade (high)	Presser	.13
Aldrich	The Rose (medium) from "Album of Songs."	Schuberth	.07
Aldrich	Thou Art So Like a Flower (medium)	Presser	.07
Barnard	The Plains of Peace (high)	B. F. Wood Music Co.	.13
Bartlett, J. C.	A Dream (medium)	Ditson	.10
Bartlett, H. N.	I Heard the Voice of Jesus Say, Op. 56, No. 1 (low)	Schirmer	.16
Beach	Ecstacy (high)	Schmidt	.10
Beach	Fairy Lullaby, Op. 37, No. 3 (high)	Schmidt	.13
Beach	The Year's at the Spring, Op. 44, No. 1 (medium)	Schmidt	.10
Beach	*Within Thy Heart (high)	Schmidt	.04
Brackett	The Lullaby of the Night (high)	B. F. Wood Music Co.	.13
Brackett	The Singing in God's Acre (high)	B. F. Wood Music Co.	.13
Buck	*My Redeemer and My Lord (high)	John Church Co.	.07
Buck	Sunset, Op. 76, No. 4 (low)	Schirmer	.19
Buck	The Skylark's Song (high)	John Church Co.	.13
Buck	When the Heart is Young, Op. 67, No. 5 (high)	Ditson	.16
Buck	*The Silent World is Sleeping, Op. 79, No. 4 (high)	Schirmer	.07
Carpenter	*Norse Lullaby (low)	H. B. Stevens Co.	.04
Chaminade	Promise (high)	John Church Co.	.13
Coombs	Four-Leaf Clover (medium)	Schirmer	.07
Crouch	Kathleen Mavourneen (high)	Schirmer	.13
DeKoven	A Winter Lullaby, Op. 51 (medium)	Schirmer	.16
DeKoven	Japanese Lullaby, Op. 53, No. 2 (medium)	Schirmer	.16
DeLara	*Garden of Sleep (low)	Schirmer	.07
Denza	A May Morning (high)	Boosey & Co.	.13
Denza	An Orchard Cradle Song (low)	Boosey & Co.	.13
Dolores	The Fairies (medium)	Ditson	.10
Emery	Lullaby, Op. 28, No. 1 (medium)	White & Goulaud	.07

*Word and melody only.

TABLE VIII — (*Continued*).

AUTHOR.	Title.	Publisher.	Price
	VOCAL—(*Continued*).		
Fontenailles	A Resolve (high)	Schirmer	$0.07
Foote	Ashes of Roses, Op. 51, No. 4 (low), from "Four Songs for Low Voices"	Schmidt	.07
Foote	A Song of Four Seasons (low)	Schmidt	.13
Foote	I'm Wearing Awa' to the Land o' the Lea! (medium)	Schmidt	.10
Foote	O Swallow, Swallow Flying South (high)	Schmidt	.13
Gaynor	Slumber Boat (medium)	Summy & Co	.07
Gounod	Jesus of Nazareth (low)	Schirmer	.19
Gounod	O, That We Two Were Maying (low)	Unknown	.13
Gounod	Sing, Smile, Slumber (medium) (with violin obligato)	Schirmer	.13
Grieg	Autumnal Gale (low)	Schirmer	.22
Guercia	L'Arte Del Canto Italiano Metodo (for tenor voice parts only)	Ricorda & Son	.13
Hahn	The Proposal, Op. 15, No. 1 (medium)	Schmidt	.07
Harris	A Madrigal (high)	Schuberth	.16
Hastings	A Red, Red Rose (high)	Schirmer	.13
Hastings	If All the Skies Were Sunshine (medium)	Schirmer	.13
Hawley	A June Madrigal (low)	Schirmer	.07
Hawley	Peace (high)	John Church Co	.10
Haydn	My Mother Bids Me Bind My Hair, Pastorelle (high)	J. J. Ewer & Co	.13
Henschel	Gypsy Serenade, Op. 20 (high)	Luckhardt & Belder	.10
Horrocks	The Bird and the Rose (low)	Schirmer	.13
Jensen	*Briar Rose (quartette for women's voices)	Schirmer	.10
Johns	At Parting (high)	Boston Music Co	.10
Johns	I Can't Help Loving Thee (high)	Boston Music Co	.10
Johns	I Love and the World is Mine (high)	Schirmer	.07
Johns	Where Blooms the Rose (high)	Boston Music Co	.10
Lachner	Thou Everywhere (low) (with violin obligato)	Schirmer	.16
L'Espoir	The New Born King (low)	F. A. Mills	.16
Liszt	Thou'rt So Like a Flower (high)	Schirmer	.10
Lloyd	The Chords of Life (low)	Schmidt	.16
MacKenzie	*Spring Song (medium)	Schirmer	.07
Marks	The Bandit Chief (low)	Percy Ashdown	.19
Massenet	Good Night (high)	Schirmer	.10
Mendelssohn	*I Would That My Love (duet for soprano and alto)	Schirmer	.13
Mendelssohn	O Rest in the Lord (low) from "Elijah"	Schirmer	.10
Needham	*The Fairies' Lullaby (high)	Boosey & Co	.10
Neidlinger	*Peggy (quartette for women's voices)	Schirmer	.10
Neidlinger	The Robin (high)	Schirmer	.07
Nevin	Mighty Lak'a Rose (low)	John Church Co	.10
Nevin	The Rosary (medium)	Boston Music Co	.07
Norris	Three Roses Red (low)	Presser	.07
Parker	Love in May, Op. 51, No. 1 (high)	John Church Co	.10
Reinecke	Spring Flowers, Op. 26 (high) (with violin obligato)	Schirmer	.16
Reinecke	The Golden Ringlet (high)	Schirmer	.07
Rubinstein	The Asra (low)	Schirmer	.10
Rubinstein	The Dream (medium)	Schirmer	.10
Schumann	Lorelei, from "Thirty Songs" (high)	Schirmer	.13
Schumann	The Lotus Flower (high)	Schirmer	.07
Smart	Callest Thou Thus, O Master (medium)	Ditson	.13
Smith, Alice	O, That We Two Were Maying (duet for alto and baritone)	Schirmer	.19
Speaks	In Maytime (medium)	John Church Co	.13
Sullivan	The Lost Chord (medium)	Schirmer	.13
Thomas	A Summer Night (low)	Schirmer	.13
Tosti	Goodbye (high)	Schirmer	.16
Willeby	Denny's Daughter (low)	John Church Co	.13
Woodfern-Finden	*The Temple Bells are Ringing (low)	Boosey & Co	.07
Woodfern-Finden	*Till I Wake (low)	Boosey & Co	.04

* Words and melody only.

TABLE VIII — (*Continued*).

AUTHOR.	Title.	Publisher.	Price.
	HYMNS.		
	Presbyterian Hymnal (the following hymns, music and words, are stereotyped); Adeste Fideles in G, Adeste Fideles in A, Alford, All Saints (new), America, Angel's Story, Antioch, Armageddon, Ariel, Arthur's Seat, Ascension, Autumn, Austrian Hymn, Benedic Anima, Bethany, Boylston, Canonbury, Carol, Chestnut Hill, Christmas, Cooling Streams, Confidence, Coronation, Creation, Dennis, Diadamata, Dominus Regit Me, Duke Street, Easter Hymn, Ein'Feste Berg, Ellers, Ephratah, Eventide, Ewing, Faben, Greenland, Hamburg, Harwell, Holy Trinity, Jesu Domine, Lambeth, Lucerne, Lux Benigna, Lyons, Materna, Mary Magdalene, Mendelssohn, Merrial, Meed, Nicaea, Olivet, Paradise, Passion Choral, Penitence, Pilgrims, Pleyel's Hymn, Presbyter, Rathbun, Regent Square, Reliance, Rosmore Sarum, Sawley, Savoy Chapel, St. Cuthbert St. Edith, St. George's Windsor, St. Gertrude, St. Kevin, St. Louis, St. Theodulph, Toplady, Trinity, University College, Vox Angelica, Waltham, Webb, Wildersmouth, Work Song, Wir Pfluegen, The Psalter Nos. 1-6, Responses to the Commandments No. 1, Responses to the Commandments, No. 2.		
	CHORUS MUSIC.		
Adams	A Warrior Bold	Silver, Burdett & Co.	$.07
Arne	" The Lass with the Delicate Air "	Schirmer	.07
Bishop	Hark, Apollo Strikes the Lyre	Novello & Co.	.07
Caldicott	Jack and Jill (Nursery Rhyme)	Schirmer	.10
Costa	With Sheathed Swords, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.16
Davy	Just Like Love	Novello, Ewer & Co.	.07
Elgar	Ave Verum, Op. 2, No. 1, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.07
Elgar	My Love Dwelt in a Northern Land, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.10
Faning	Song of the Vikings, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.13
Ford	Since First I saw your Face (Composed in 1609)	Schirmer	.04
Garrett	O, My Love's Like a Red, Red Rose, from Chautauqua Book, No. 3 (Hallam)	Novello, Ewer & Co.	.04
Gounod	Sanctus, from Chautauqua Chorus Book, No. 3, (Hallam)	Novello, Ewer & Co.	.10
Gounod	Send out thy Light, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.10
Haydn	Achieved is the Glorious Work, from The Creation	Schirmer	.10
Handel	Hallelujah Chorus, from the Messiah	Novello, Ewer & Co.	.13
Handel	See the Conquering Hero Comes, from Songs of America and Homeland	Silver, Burdett & Co.	.07
Hatten	He That Hath a Pleasant Face	Novello, Ewer & Co.	.07
Hopkins	Lift Up Your Heads, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.07
Kuchen	There's One That I Love Dearly	Novello, Ewer & Co.	.04
McFarren	Hosanna to the Son of David	Novello, Ewer & Co.	.10
McFarren	The Lord is My Shepherd	Novello, Ewer & Co.	.07
Mendelssohn	" But the Lord is Mindful of His Own "	Schirmer	.07
Mendelssohn	" How Lovely are the Messengers "	Schirmer	.07
Mendelssohn	The Lark's Song	Schirmer	.04
Mozart	Gloria in Excelsis	W. A. Pond	.10
Rossini	Night's Shade no Longer	Ditson	.07
Phyla	Hail Columbia, from Harmonic Fifth Reader, by Ripley & Tapper	American Book Co.	.07
Schilling	Te Deum (organ accompaniment)	Schirmer	.16
Smart	Softly Come, Thou Evening Gale	Oliver, Ditson & Co.	.04
Smith	O'er the Meadows, from Chautauqua Chorus Book, No. 3 (Hallam)	Novello, Ewer & Co.	.04
Stainer	What are These that are Arrayed in White Robes, from Chautauqua Chorus Book No. 3 (Hallam)	Novello, Ewer & Co.	.07

TABLE VIII — (*Concluded*).

AUTHOR.	Title.	Publisher.	Price.
	PATRIOTIC SONGS.		
Arne	Rule Britannia, from Songs of America and Homeland (Johnson)	Silver, Burdett & Co.	$0.04
Emmet	Dixie's Land, from Songs of America and Homeland (Johnson)	Silver, Burdett & Co.	.04
Foster	My Old Kentucky Home, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Foster	Old Folks at Home, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Howe	Battle Hymn of the Republic, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Jordan	The Bluebells of Scotland, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Key	The Star Spangled Banner, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Kittredge	Tenting on the Old Camp Ground, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04
Lwoff	Russian National Hymn, from Songs of America and Homeland (Johnson)	Silver, Burdett & Co.	.04
Shaw	Columbia, the Gem of the Ocean, from Songs of America and Homeland, (Johnson)	Silver, Burdett & Co.	.04
Wilhelm	The Watch on the Rhine, from Songs of America and Homeland (Johnson)	Silver, Burdett & Co.	.04
	Maryland, My Maryland, from Songs of the Nation (Johnson)	Silver, Burdett & Co.	.04

ADDRESSES OF MUSIC PUBLISHERS.

American Book Co., New York.
Andree, Johann, Leipzig.
Ashdown, Percy, New York.
Ashmall, Wm. E., Arlington, N. J.
Augener & Co., London.
Boosey & Co., New York.
Boston Music Co., Boston.
Bosworth & Co., Leipzig.
Bote, Ed., & Back, G., Berlin.
Brainard's S., Sons, Chicago.
Brehm Bros., Erie, Pa.
Breitkopf & Haertel, Leipzig.
Chanot, F. W., London.
Church, John, Co., New York.
Ditson, Oliver, Co., Boston.
Ewer & Co., London.
Fiest Co., New York.
Fischer, C., New York.
Forberg, Robert, Leipzig.
Grossman's Sons, Hamilton, Ont.
Hainauer, Jules, Breslau.
Harms, T. B., & Co., New York.
Hofmeister, Leipzig.
Houghton, Mifflin & Co., Boston.
Howe, Elias, Boston.
Ingram, Tolbret R., Music Co., Denver.
Jordan & Son, T., New York.
Laudy & Co., London.
Lee & Walker, Chicago.
Leidt, M. M., New York.
Luckhardt & Belder, New York.
McKinley Music Co., Chicago.
Meser, C. F., Berlin.
Millet, J. B., Co., Boston.
Mills, F. A., New York.
Novello, Ewer & Co., New York.
Pond & Co., New York.
Presbyterian Board of Publication, Philadelphia.
Presser, Theodore, Philadelphia.
Rahter & Co., Leipzig.
Ries & Erler, Berlin.
Rieter-Biedermann, Leipzig.
Ricorda & Co., Rome.
Rogers & Eastman, Cleveland.
Rogers, J. H., Cleveland.
Schirmer, G., New York.
Schmidt, Arthur P., Boston.
Schott & Co., London.
Schuberth & Co., New York.
Schroeder, J. H., New York.
Silver, Burdett & Co., New York.
Simrock, N., Berlin.
Stevens, H. B., Co., New York.
Summy, Clayton F., Chicago.
The Parish Choir, Boston.
Vandersloot Music Co., Williamsport, Pa.
White & Goulaud, Boston.
White-Smith Co., Boston.
Wood, B. F., Music Co., Boston.

LITERARY WORK.

The following is in New York Point:

AUTHOR.	Title.	Publisher.	Price.
Alcott, Louisa	Louisa Alcott Reader	Little, Brown & Co.	$1.42
Auerbach	Briggita	American Book Co.	1.00
Baldwin	Robinson Crusoe for Children	American Book Co.	1.10
Blaisdell	Child Life in Tale and Fable	MacMillan	.75
Carpenter	A Geogaphical Reader of North America	American Book Co.	2.50
Carpenter	A Geographical Reader of South America	American Book Co.	2.40
Carpenter	A Geographical Reader of Europe	American Book Co.	3.35
Carpenter	A Geographical Reader of Asia	American Book Co.	2 25
Carlyle	Essay on Burns	Ginn & Co	1.20
Davidson	Study of Ivanhoe	Davidson	.30
Goethe	Erl King, from Faemtliche Werke, Erster Band		.05
Guerber	Maerchen und Erzaehlungen	D. C. Heath	.95
Heine	Die Grenadier, from Faemtliche Werke, Erster Band		.10
Holtzclaw	Lives of Great Men	Potter & Putnam	.45
Hunter	Elements of Biology (botany and zoology)	American Book Co.	3.82
Macaulay	Essay on Addison	Ginn & Co	1.10
Teller & Brown	Business Methods, No. 1	Rand & McNally	3.30
	The Lady of the Lake, from Round Table Booklet	Round Table Co	.25
Wilson	History Reader	MacMillan	2 35

ADDRESSES OF PUBLISHERS.

American Book Co., New York.
Ginn & Co., Boston.
Heath, D. C., & Co., Boston.
Little, Brown & Co., Boston.
MacMillan Co., New York.
Potter & Palmer, New York.
Rand & McNally, New York.
Round Table Co., McMinnville, Oregon.

TABLE IX.

INSTITUTIONS FOR THE BLIND IN THE UNITED STATES.

(Corrected July 1, 1910 [Complete]).

STATE.	Place.	Name.	Superintendent.
Alabama	Talladega	Institution for the Deaf, Dumb and the Blind	J. H. Johnson.
	Talladega	Alabama School for the Blind	F. H. Manning.
	Talladega	School for the Negro Deaf Mutes and Blind	J. S. Graves.
Arkansas	Little Rock	School for the Blind	S. D. Lueas.
California	Berkeley	Institution for the Education of the Deaf and Dumb and the Blind	Douglas Keith.
Colorado	Colorado Springs	School for the Deaf and the Blind	W. K. Argo.
Connecticut	Hartford	Connecticut School for the Blind	George A. Marshall.
Florida	St. Augustine	Institution for the Deaf and the Blind	A. H. Walker.
Georgia	Macon	Academy for the Blind	G. F. Oliphant.
Idaho	Boise	Institution for Blind	Paul Martin.
Illinois	Jacksonville	Institution for the Education of the Blind	G. W. Jones.
Indiana	Indianapolis	Institute for the Education of the Blind	George S. Wilson.
Iowa	Vinton	College for the Blind	George D. Eaton.
Kansas	Kansas City	Institution for the Education of the Blind	W. B. Hall.
Kentucky	Louisville	Institution for the Education of the Blind	B. B. Huntoon.
Louisiana	Baton Rouge	Institution for the Blind	W. W. Bynum.
Maryland	Baltimore	School for the Blind	John F. Bledsoe.
	Baltimore	School for the Colored Blind and Deaf Mutes	John F. Bledsoe.
Massachuestts	Boston	Perkins Institution and Massachusetts School for the Blind	Edward E. Allen.
Michigan	Lansing	School for the Blind	Clarence E. Holmes.
Minnesota	Faribault	School for the Blind	J. J. Dow.
Mississippi	Jackson	Institute for the Blind	W. S. Simms, M. D.
Missouri	St. Louis	School for the Blind	S. M. Green.
Montana	Boulder	School for the Deaf and Blind	L. E. Milligan.
Nebraska	Nebraska City	Institution for the Blind	N. C. Abbott.
New Mexico	Alamogordo	Institution for Blind	R. R. Pratt.
New York	Batavia	State School for the Blind	C. A. Hamilton.
	New York City	Institution for the Blind	Everett B. Tewksbury.
North Carolina	Raleigh	Institution for the Deaf and Dumb and the Blind	John E. Ray.
North Dakota	Bathgate	North Dakota School for the Blind	B. P. Chapple
Ohio	Columbus	Institution for the Education of the Blind	Edward M. Van Cleve.
Oklahoma	Fort Gibson	Institution for the Blind	George W. Bruce.
Oregon	Salem	Institute for the Blind	E. T. Moores.
Pennsylvania	Philadelphia	Institution for the Instruction of the Blind	O. H. Burritt.
	Pittsburg	Western Pennsylvania Institution for the Blind	T. S. McAloney.

TABLE IX — (*Continued*).

STATE.	Place.	Name.	Superintendent.
South Carolina	Cedar Springs	South Carolina Institution for the Education of the Deaf and Blind	N. F. Walker.
South Dakota	Gary	School for the Blind	Lelia M. Curl.
Tennessee	Nashville	School for the Blind	J. V. Armstrong.
Texas	Austin	Institution for the Blind	J. H. Gillespie.
	Austin	Institution for Deaf and Dumb and Blind Colored Youth	H. S. Thompson.
Utah	Ogden	University of Utah (Department for Blind)	F. M. Driggs.
Virginia	Staunton	Institution for the Education of the Deaf and Dumb and Blind	W. A. Bowels.
	Newport News	School for Colored Deaf and Blind Children	William C. Ritter.
Washington	Vancouver	School for the Defective Youth	George H. Mullen.
West Virginia	Romney	School for the Deaf and the Blind	R. Carey Montague.
Wisconsin	Janesville	School for the Blind	J T. Brown.

TABLE X.

LIST OF INSTITUTIONS, OTHER THAN SCHOOLS, FOR THE BLIND IN THE UNITED STATES, AS GIVEN IN THE SPECIAL REPORT ON BENEVOLENT INSTITUTIONS ISSUED BY THE BUREAU OF CENSUS OF THE DEPARTMENT OF COMMERCE AND LABOR, AND IN THE REPORT OF THE NEW YORK STATE COMMISSION OF 1903 TO INVESTIGATE THE CONDITION OF THE ADULT BLIND.

Industrial Home of Mechanical Trades for the Adult Blind, Oakland, Cal.

Connecticut Institute and Industrial Home for the Blind, 334 and 336 Wethersfield avenue, Hartford, Conn.

Columbia Polytechnic Institute for the Blind, Washington, D. C.

Washington Home for the Blind, 915 E. street N. W., Washington, D. C.

Illinois Industrial Home for the Blind, corner 19th and Marshall streets, Chicago, Ill.

Indiana Industrial Home for Blind Men, Indianapolis, Ind.

Boston Nursery for Blind Babies, 66 Fort avenue, Roxbury, Mass.

Workshops for the Blind, South Boston, Mass.

Industrial Home and School for the Blind, Portland, Me.

Michigan Employment Institution for the Blind, Saginaw, Mich.

Blind Girls' Home, 1214 North Garrison avenue, St. Louis, Mo.

St. Joseph's Home for the Blind, Pavonia avenue, Jersey City, N. J.

The Society for the Relief of the Destitute Blind, Amsterdam avenue and 104th street, New York city.

St. Joseph's Blind Asylum, Mt. Loretto, Prince's Bay, Staten Island, New York city.

Church Home for the Blind, 550 Washington avenue, Brooklyn, N. Y.

The Industrial Home for the Blind, 512 Gates avenue, Brooklyn, N. Y.

Clovernook Home for the Blind, Mt. Healthy, Ohio.

Pennsylvania Working Home for Blind Men, 3518 Lancaster avenue, Philadelphia, Pa.

The Pennsylvania Industrial Home for Blind Women, 3827 Powelton avenue, Philadelphia, Pa.

Workshops for the Blind, Milwaukee, Wis.

GENERAL INFORMATION CONCERNING THE NEW YORK STATE SCHOOL FOR THE BLIND.

Location.

This school is located at Batavia, about midway between Rochester and Buffalo, on the New York Central, Lehigh and Erie railroads, hence is easy of access and has excellent train service.

Site.

The buildings are situated on a rise of ground in the northern part of the village. The soil is dry and well drained, and the water and air pure and healthful.

Buildings.

There are in all eleven buildings which constitute the equipment of the school. The oldest of these is the main building, which is the home and school building. In this building all the work of the school in all its departments is conducted, with the exception of the gymnasium classes and the piano tuning, broom-making, mattress-making and chair caning. The building is three stories high, and consists of the central portion and two wings. This is built around an inside court which admits light and air into all of the rooms, there being no room in the building which does not admit air directly through an outside window. The east wing is occupied entirely by the girls and the west wing entirely by the boys.

The school is provided with a modern gymnasium which is well equipped with apparatus of various kinds.

A hospital is also provided where cases of contagious disease are taken as they develop and placed in the hands of a trained nurse.

The industrial building is a neat brick structure two stories in height, the first floor of which is occupied by the piano tuning department, while the second floor is used for broommaking, mattress-making and chair caning.

These are the chief buildings which appertain directly to the work of the school. Others are the power-house, in which the boilers which heat the main building, hospital and greenhouse are located, thus obviating all danger from explosion, and reducing to a minimum the danger from fire. The second floor of this building is occupied with the laundry machinery. The greenhouse, horse barn, new storage barn, and old barn, which serves the purpose of an icehouse; the sewage building, and the small building in the park which houses the pump from which the water supply for drinking is procured, constitute the remaining buildings connected with the school.

Purpose.

The object of this school is to furnish an education and training in some useful trade to all children who, on account of defective vision, are unable to secure an education in the public schools.

Departments.

The school carries on five distinct, yet co-ordinate, lines of education, as follows:

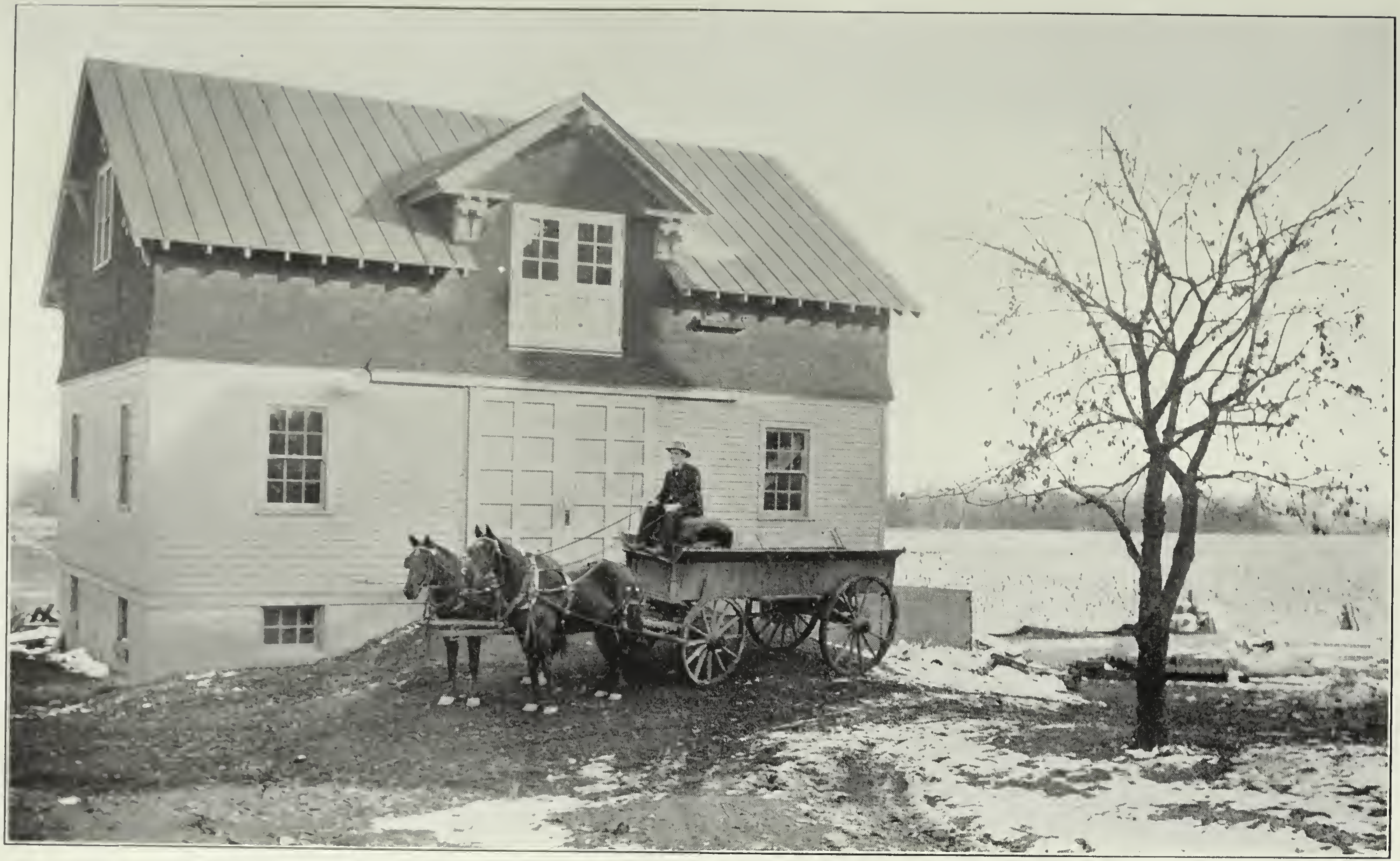
1. Physical.— Regular daily open-air exercise and a daily period in the gymnasium, under the direction of a competent instructor, are required of all the pupils.

2. Moral and Religious.— Daily chapel exercises are held, and regular attendance is required at the church selected by each pupil's parents or guardian.

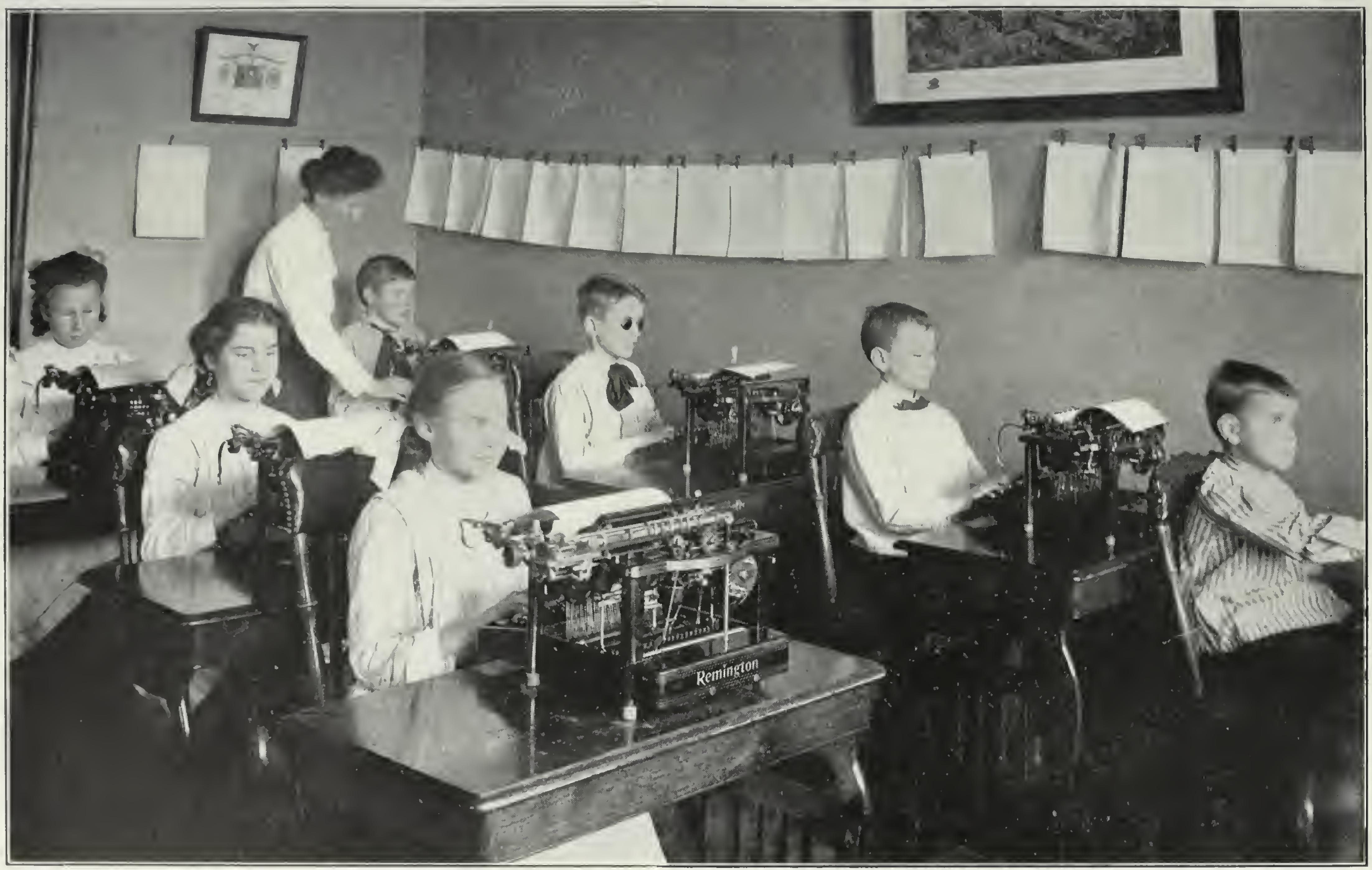
3. Literary.— A complete course, including kindergarten, grammar and high school.

4. Musical.— Exceptional facilities for voice training; teaching of piano, violin, pipe organ, string and wind instruments.

5. Industrial.— Sewing, knitting, bead work, chair caning, basket-making, piano tuning, mattress and broommaking, shorthand and typewriting, and some opportunity for farm work.



New Storage Barn and Farm Team.



The Beginning Class in Typewriting.

Success of Former Pupils.

Graduates of this school have successfully pursued courses in Rochester, Syracuse and Columbia Universities. Some are successful teachers of music, and some are prosperous business men. Others are earning $7.50 to $20 per week tuning pianos. Still others are earning a comfortable livelihood as broommakers, stenographers and typewriters, and in crocheting, knitting, and so forth. The history of our school proves that a blind child, who is normal aside from his blindness, may become a self-supporting, useful and contented citizen.

Expenses.

This school is as free to blind children as are the public schools of the State to seeing children. In fact, it does more, as it furnishes board and washing absolutely free, as well as an education. All that parents are required to do is to clothe their children and to pay their carfare to and from school. Even these items can be taken care of upon satisfactory proof of parents' inability to provide them.

Who Are Eligible for Admission.

Article XXIII of the by-laws of the school says that "All blind persons residing in the State of New York who are not under five or above twenty-one years of age, and who are not incapacitated by physical, mental or moral infirmity for useful instruction, shall be considered eligible for admission as pupils of the school." It should be stated in explanation of this by-law that all persons are considered "blind" for the purposes enumerated in the quotation above who are either totally blind or whose vision is so defective as to render them incapable of receiving instruction in the public schools of the State. Fully 50 per cent of our pupils can see in varying degrees, some of them having light perception only.

School Year.

According to the by-laws of the Board, school shall open on the third Wednesday in September and close on the Wednesday preceding the week of Regents examinations in June.

Best Age to Enter.

The school accepts pupils between the ages of five and twenty-one, but experience has taught that the earlier the child enters the school the brighter are his chances of becoming a useful, self-supporting, and hence happy citizen. It is a mistake to keep children at home waiting for them to reach their teens before sending them. A blind child might better come at five than wait until he is fifteen. The teachers and matrons are large-hearted, sympathetic men and women, and the school is made as homelike as possible. A physician visits the school daily when needed. Parents may be certain that their children are receiving good care.

Parents of blind children are cordially invited to visit the school, where they will, so far as possible, be entertained without expense. They should realize that this school is maintained for their children and that it is their privilege and duty to make use of it.

Further information, circulars and application blanks may be obtained by addressing Dr. F. Park Lewis, President Board of Managers, 454 Franklin street, Buffalo, N. Y., or C. A. Hamilton, Superintendent, Batavia, N. Y.

STATEMENT OF THE NEEDS OF THE PUPILS WHO ARE COMING TO OUR SCHOOL.

The following statement of the needs of pupils who are coming to our school has been prepared by the matrons. It will answer many questions, and save unnecessary correspondence:

Girls.

1 coat.
1 play coat
1 hat
1 hood.
1 Sunday dress.
1 week-day dress
2 petticoats.
2 suits underwear.
2 nightdresses.
2 corset waists.
4 pairs stockings.
2 pairs shoes.
1 pair rubbers.
3 aprons.
1 pair mittens.
1 pair side elastics.
6 handkerchiefs.
4 hand towels.
2 bath towels.
2 wash cloths.
Brush and comb.
Tooth brush.
Umbrella.

Older Boys.

1 Sunday suit.
1 week-day suit.
2 pairs extra trousers.
1 overcoat.
2 suits underwear.
4 shirts.
6 collars.
3 night shirts.
2 pairs suspenders.
2 pairs shoes.
1 pair rubbers.
4 pair socks.
3 neckties.
1 muffler.
1 summer hat or cap.
1 winter hat or cap.
1 pair mittens.
Umbrella.
5 towels.
5 bath towels.
Comb and brush.
Tooth brush.
8 handkerchiefs.

Younger Boys.

1 Sunday suit.
1 week-day suit.
3 pairs extra trousers.
4 colored blouses.
2 white blouses.
1 Sunday overcoat.
1 play overcoat.
2 suits underwear.
2 night shirts.
2 pairs suspenders.
2 pairs elastic garters.
2 pairs shoes.
1 pair rubbers.
6 pairs stockings.
3 Windsor ties.
1 summer Sunday cap.
1 summer play cap.
1 winter Sunday cap.
1 winter play cap.
1 pair mittens.
5 towels.
2 bath towels.
Comb and brush.
Tooth brush.
8 handkerchiefs.

All clothing should be plainly marked.

It would be well for each girl to have two school dresses and an umbrella, if possible.

TO THE PARENTS OF SEEING AND OF BLIND CHILDREN.

Translated from the Report for 1893, of the Private Institution for the Blind in Linz, in Upper Austria, by Edward E. Allen.

I.

What shall parents do to keep their seeing children from becoming blind?

If your children have their eyesight, thank God, and take every care to preserve it, giving special heed to the following suggestions:

1. As soon as a child is born, insist that the nurse shall cleanse its eyes properly, as laid down in the regulations. You should yourself examine your child's eyes daily for the first week; and, if the slightest redness or mattery discharge appears on the lids, summon your physician at once, and follow his directions to the letter. Should you be unable to get him immediately, cleanse the child's eyes as often as a trace of matter appears in them, using for the purpose a clean linen rag or an absolutely clean bit of sponge. Wash from the nose outward over the place where the lids separate. Besides doing this, you should keep on the eye a fine linen rag, which must be kept cold either by dipping it in icewater or by laying it upon pieces of ice. This rag should not be too wet, and must be exchanged for a cold one just as soon as it becomes warm. In case one eye only is inflamed, take the greatest care not to touch the well eye with the rag, the sponge, or the water used upon the affected eye. This inflammation of the eyes of the newly born is a very dangerous thing. Unless the proper means be immediately employed, the inflammation generally destroys the eyesight wholly. Out of every one hundred blind children in Germany, twenty-five have lost their sight from this disease. But if you call in the physician at once and follow out his advice, you may confidently hope that your child will retain its eyesight.

II.

How shall parents manage their blind children in their early years at home, and how bring them up?

If you have a blind child, consider that God has given it to you to be tended with unusual love and care. If you give it proper care and it lives to grow up, it will be a capable and happy human being, who will fill its place in life and will bring comfort to you. But if, on the contrary, you neglect or spoil your child, it will then be a poor bit of humanity, a burden both to you and to itself. Hence attend to the following rules:

1. Treat the blind child exactly as if it were a seeing child, and try as early as possible to make it put its body and mind into action. As soon as it begins to use its hands, give it toys to play with. Talk to it, sing to it, and give it toys that make a noise, to attract its attention and rouse its mind.
2. Teach the child to walk at the age when seeing children learn.
3. Do not allow the child to sit long in one place alone and unoccupied; but encourage it to go about in the room, in the house, in the yard, and, when older, even about the town. Teach it to know by touch all objects around it.
4. As soon as possible teach the child to dress and undress, to wash itself, to comb its hair, to take care of its clothes, and, when at table, to use properly spoon, fork and knife. A blind child can do all these things as well as a seeing child; but you must give it much practice in doing them, because it cannot learn by observation.
5. Watch carefully the child's personal appearance. It cannot see how others act, and so readily acquires habits which are disagreeable to its companions. Some of the most common mannerisms of blind children are rocking the body, twisting the head about, sticking the fingers into the eyes, distorting the face, swinging the arms, stooping and hanging the head in walking, and bending over in sitting. As soon as you observe such practices in your child, you should make a vigorous attempt to break them up; for, if they once become habitual, years of schooling may be unable to overcome them.

6. Permit the blind child to play as much as possible with seeing children, and to romp often with them out of doors. Frequently take the child walking, and direct it in some simple physical exercises. If it is obliged to sit still, you should at least give it balls, pebbles, blocks, a doll, a harmonica, or such other toys as appeal to touch and to hearing.

7. If you would inform your child of the world about it, you must let it touch all the objects that you can get at, and must teach it to appreciate space and distance by actual measurement. To cultivate its sense of touch, let it handle familiar objects, like different woods, plants and coins.

8. Allow the child to take part as early as possible in household duties. Allow it to string buttons or shells; to shell and pick over beans, peas and nuts; to clean furniture and kitchen utensils; to wash dishes; to grind the coffee; to peel potatoes; to gather the fruit in the garden; to feed the hens, doves, dog, cat and other domestic animals. You can also occupy the child pretty well in easy handiwork, such as winding yarn, braiding the hair and in coarse knitting.

9. Speak with your child much and often; for, since it cannot read the loving care which is written on your face, it has special need to hear your voice. Ask the child frequently what it hears or feels, and induce it to ask many questions as to what is going on around it.

10. Take care what you say before your child; for the blind child is more attentive to all which it hears than the seeing child is, and for this reason retains it better.

11. When in the presence of your child, never indulge in expressions of pity for its blindness, and suffer no one else to do so. Such expressions can only discourage and depress the child. Rather seek to encourage it and to keep it engaged in happy activity, in order that it may strive cheerfully and courageously to be independent later in life, and to do without external consolation and assistance.

12. Give the child occasion to exercise its memory. A good memory will later be found invaluable. Have it commit to memory such proverbs, short poems and stories as it enjoys.

13. The blind child's moral and religious nature can be developed just as early as the seeing child's.

14. As soon as the child is of school age (six years old) send it, if possible, to the Institution for the Education of the Blind at Linz. To make this possible, you must apply in good season, say six months in advance. The superintendent will then tell you what questions you will have to answer before your child can be admitted.

15. If it cannot be admitted to the institution before it is seven, then send it with its seeing mates to public school. In this case you should beg the teacher to visit the Institution for the Blind at Linz, so that he may learn something of the way blind children are taught, and that he may get the necessary special appliances, such as books embossed for the blind and Klein's writing apparatus.

(It is, of course, understood that the institution mentioned in paragraphs 14 and 15 is not the one to which New York State children should be sent. Residents of New York State should apply either to the New York State School for the Blind at Batavia, N. Y., or, if residents of New York city or counties adjoining, to the New York Institution for the Blind, Thirty-fourth street and Ninth avenue, New York city.)

Copies of the above professional advice may be had for the asking. It was written by Mr. W. Mecker, Director of the Institution for the Blind in Düren, near Cologne, in conjunction with Dr. H. Saemisch, Consulting Physician and Professor of Ophthalmology in Bonn. Nearly one half a million copies have been distributed in the Rhine Province to parents and others. This advice is the result of the experience of many years. Would that every one reading it should take pains to spread the information among the people by word and deed, and would that the excellent editorial staff of the various newspapers should take notice of it and publish it for the good of the country! If a single child be saved from blindness by this means a dreadful misfortune will be averted.

EIGHTY-SIXTH ANNUAL REPORT

OF THE

MANAGERS

OF THE

Society for the Reformation of Juvenile Delinquents

IN THE

CITY OF NEW YORK

TO THE

LEGISLATURE OF THE STATE

AND THE

CORPORATION OF THE CITY OF NEW YORK

YEAR ENDING SEPTEMBER 30, 1910

TRANSMITTED TO THE LEGISLATURE JANUARY 20, 1911

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

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HONORARY COUNCIL OF FORMER MANAGERS

(Created by By-Laws)

William Gaston Hamilton
John S. Barnes
Alexander E. Orr

OFFICERS AND MANAGERS

1910-1911

President

J. Hampden Robb

Vice-Presidents

James H. Fay
Isaac Townsend

Treasurer

Winthrop Burr

Secretary

Evert Jansen Wendell

Managers Ex-Officio

The Governor
The Comptroller
The Attorney-General

(Chapter 441, Laws of 1898)

Term Expires 1911

Emanuel W. Bloomingdale
James H. Fay
Winthrop Burr
J. Hampden Robb
Phillips B. Thompson
Stuyvesant F. Morris
J. Sanford Barnes, Jr.

Term Expires 1912

William B. Osgood Field
George W. Folsom
Newbold Morris
Isaac Townsend
William I. Walter

Term Expires 1913

John D. Crimmins
John T. Sill
Herbert Parsons
John J. Townsend
Evert Jansen Wendell
Richard M. Hoe

STANDING COMMITTEES

1910-1911

Executive Committee

Isaac Townsend
Newbold Morris
Richard M. Hoe
J. J. Townsend
Phillips B. Thompson
Emanuel W. Bloomingdale
John T. Sill

School and Library Committee

J. J. Townsend
Evert Jansen Wendell
Phillips B. Thompson
Wm. B. Osgood Field
Herbert Parsons

Indenturing Committee

Stuyvesant F. Morris
Evert Jansen Wendell
William I. Walter
Wm. B. Osgood Field
George W. Folsom
J. Sanford Barnes, Jr.

Committee on Law and Legislation

John J. Townsend
James H. Fay
John D. Crimmins

Committee on Annual Report

John J. Townsend
James H. Fay
Newbold Morris

Committee on Insurance

John D. Crimmins
Newbold Morris
Winthrop Burr

Committee on Nominations

J. Hampden Robb
John J. Townsend
Stuyvesant F. Morris
James H. Fay
George W. Folsom

Ladies' Committee

Mrs. Gordon Knox Bell
Mrs. Amos R. E. Pinchot
Mrs. Thomas N. Rhinelander

OFFICERS OF THE HOUSE

1910-1911

**Superintendent*
Colonel Edward C. Barber

**Assistant Superintendent*
Louis Croly

Military Instructor and Disciplinarian
Colonel A. J. Schauz

Chief Clerk
John W. Higgins

General Bookkeeper
Miss H. L. Underhill

Chief Parole Agent
Frederick C. Helbing

Assistant Parole Agents
William C. O'Keefe John H. Towner
Xavier Bongiorno

Principal of Schools
Miss Annette M. Arnold

Physician
W. G. Eynon, M. D.

Oculist
W. Whitehead Gilfillan, M. D.

Dental Surgeon
A. Walter Hermann, D. D. S.

Steward
William B. Wemple

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*Acting.

STATE OF NEW YORK

No. 14

IN ASSEMBLY

JANUARY 20, 1911

EIGHTY-SIXTH ANNUAL REPORT

To the Legislature of the State of New York and to the Corporation of the City of New York:

The Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York hereby make their annual report for the year ending September 30, 1910.

The whole number of children received into the House of Refuge since its establishment in the said city in the year 1824 is 31,673. During the year past 962 boys have been cared for by the Society, of whom 549 have been paroled or discharged to their parents, friends or employers, leaving in the Refuge at this date 413 boys.

Tables are appended and made a part of this report giving details of the offenses, age and parentage of the inmates, and other valuable statistics.

No children are received into the Refuge but boys, and none unless committed by a magistrate or court of competent jurisdiction. No commitment is allowed by law of a boy under twelve years of age except in cases of felony, or of any boy over sixteen years of age.

The classification of the boys is into four divisions, as follows: *First,* a primary division for the smallest boys entirely in charge of women; *second,* a division for boys of intermediate age and development; *third,* a division for older boys, and *fourth,* a division for boys under discipline.

The training of the boys is accomplished in four ways, as follows:

Firstly. By religious instruction. Services and teaching are given by a Protestant Clergyman, a Roman Catholic Priest and a Hebrew Rabbi chosen and maintained by their respective churches.

Secondly. By scholastic instruction in a common school where women teachers conduct classes during eleven months in the year in all branches usual in schools for boys.

Thirdly. By vocational instruction in which the boys are taught some useful trade or other method of earning an honest living. Classes are conducted in painting, printing, carpentry, blacksmithing, plumbing, masonry, machine work, steam firing and steamfitting where the instruction is theoretical and practical. Lessons in drawing, designing and sloyd work are also given. There are also classes in tailoring, shoemaking, bread-making, cooking, laundry, barbering, electrical work and gardening. The boys also furnish the crew of the steam tug and gasoline launch. All repair work is done by the boys. This instruction in manual training teaches the concentration of mind as nothing else does, in addition to fitting them for work in the outdoor world.

Fourthly. By military instruction. The boys are organized as an infantry regiment with arms and a band, their drill while including company and battalion drill and the evolutions of the regiment, pays special attention to physical drill, which gives a smart carriage to the boys, and the system inculcates habits of neatness and respect for discipline and an *esprit de corps.*

This curriculum with its variety appealing to moral sense, intellect, development of earning power and physical improvement, does away with the deadening influence of routine so depressing to the youthful mind.

The results of the parole system are most gratifying. With the means afforded by antiquated buildings, which allow only an unsatisfactory system of classification and cramped surroundings, the success of the system is remarkable and much greater progress is expected when the institution is moved to its new site in the country.

The Indenturing Committee, which is charged with the duty of examining into the cases of boys ready for parole, has devoted much time during the past year to the work, and have added a new feature in that all boys returned to the institution for violation of parole, now appear in person before the committee at its first meeting after their return. The cases are thoroughly gone into and a determination made by the committee as to period of detention.

An appropriation of $156,000 is desired for maintenance for the fiscal year ending September 30, 1912, estimated at a per capita cost substantially the same as at present.

A special appropriation of $10,000 is also desired for the purpose of maintaining the trade schools, equipment and supplies, hospital equipment, painting, steam, plumbing and electrical repairs, new window-sash, reglazing, carpentry work, repairs to boat "Refuge," dock repairs, renewing furniture in officers' quarters and for other necessary repairs and equipment.

Attention is especially invited to the reports of the superintendent, principal of the schools and other officers of the house, which will be found hereto appended, together with other interesting data connected with the institution.

In June Mr. Joseph P. Byers, the superintendent, presented his resignation, to take effect October 15, 1910, he having been offered the position of general secretary of the State Charities Aid and Prison Reform Association of New Jersey. He became superintendent of the House of Refuge January 1, 1905. The resignation was accepted with sincere regret by the Board of Managers. Reference is made to the accompanying resolution of the board. The State of New York, through Mr. Byers' resignation, loses a public servant who combined executive and humane qualities, both of the highest order, and whose personal influence it may be said, has left a deep and lasting mark upon the lives of those who have been at different times committed to his care.

The board also desire to note their regret at the resignation of Mr. Louis Croly, the clerk of the board, and who, in that or a like capacity has been in the employ of this institution since 1897. The discharge by him of all his duties cannot be too highly commended, as also his kind and sympathetic bearing towards the inmates of the institution, and particularly the new comers on their entering its doors.

The institution, pending the selection of a superintendent, has been placed in charge of Col. Edward C. Barber, as acting superintendent. Mr. Barber's services as assistant superintendent have shown such qualities as fully to justify the belief that the interests of the institution, its officers and its inmates, will be amply safeguarded in his hands.

As heretofore, all committing magistrates of the City of New York and of the other Hudson River and Long Island municipalities are particularly invited to visit and inspect the House of Refuge at any time. The house is easy of access by ferry from the foot of 125th street, East River. A half-hourly service is maintained.

All of which is respectfully submitted.

J. HAMPDEN ROBB,
President.

EVERT JANSEN WENDELL,
Secretary.

NEW YORK, *September* 30, 1910.

Annual Report of the Treasurer of the Society for the Reformation of Juvenile Delinquents in the City of New York.

October 1, 1909, to September 30, 1910:

Balance October 1, 1909	$298 03	
State appropriation	138,750 00	
Board of Education, New York city.	8,805 00	
All other sources	125 28	
		$147,978 31
Salaries and wages	$73,071 98	
Expenses of officers	434 82	
Provisions	35,620 39	
Household stores	3,825 28	
Clothing	11,567 38	
Fuel and light	10,469 10	
Hospital and medical supplies	554 65	
Shop, farm and garden supplies	4,339 88	
Ordinary repairs	115 60	
Transportation of inmates	1,311 39	
Miscellaneous	3,733 80	
	$145,044 27	
Remittance to State treasury	125 28	
		145,169 55
Balance on hand to credit of Society, September 30, 1910		$2,808 76

Library Fund

Amount invested	$11,000 00
Amount on deposit	1,682 18
Total	$12,682 18

September 30, 1910.

Statement of Net Expenses for Maintenance for the Fiscal Year Ending September 30, 1910.

Stores on hand October 1, 1909....	$368 85	
Paid for supplies and improvements during the year	145,044 27	
		$145,413 12
Amount of stores on hand September 30, 1910....		516 43
Net expenses for the year.................		$144,896 69

DISBURSEMENTS — SPECIAL APPROPRIATION

October 1, 1909, to September 30, 1910:

Balance October 1, 1909	$547 08
State Comptroller	9,138 72
	$9,685 80

Repairs and equipment "AA" (Chap. 469, Laws 1908)................................	$60 13
Repairs, equipment, etc., "A" (Chap. 461, Laws 1909)................................	4,832 77
Repairs and equipment "AA" (Chap. 508, Laws 1910)................................	4,792 90
	$9,685 80

PER CAPITA COST FOR 1910

The per capita cost for the year, based on total expenditures, and a daily average population of 505.22, was $286.85, divided as follows:

For salaries and wages..........................	$144 43
Provisions..................................	70 50
Fuel and light..............................	20 72
Clothing....................................	22 89

Shops, farm and garden	$8 59
Household stores	7 57
Expenses of officers and transportation of inmates	3 45
Hospital and medical supplies	1 09
Ordinary repairs	22
Miscellaneous	7 39
	$286 85

REPORT OF THE SUPERINTENDENT

To the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York:

Gentlemen.— I have the honor to submit herewith my annual report for the year ending September 30, 1910.

On October 1, 1909, the population was 618. We received during the year by commitment, 150; returned for violation of parole, 170; returned voluntarily, 19; escapes returned, 5; total for the year, 962.

During the year paroles were granted to 534; deported to home countries, 2; sentenced through courts to penal institutions, 2; escapes (3 recaptured) 4; died, 1; transferred to hospitals and asylums, 4; on writs and otherwise, 2; total loss of 549; leaving in the house on September 30, 1910, 413 boys. The total number of boys for the year (962) shows a decrease from the preceding year of 231. This decrease has been due to a marked falling off in the number of new commitments. Last year we received from this source 288; this year but 150. The cause of this very unusual reduction in commitments is found, I believe, in the operation of our juvenile courts and the free use of the suspended sentence and probation. It is an increasingly hopeful sign that newer methods are tending to decrease the number of delinquents requiring institutional treatment. It is questionable, however, if the use of these methods has not been extreme, in many cases merely postponing time after time the inevitable day when commitment becomes a necessity. That day comes when the power of the court as exercised through its probation officers ceases to exert a controlling influence over many of those who are under its jurisdiction. When to a contempt for parental, school and church control is added a disregard for the control of the courts, there would seem to be no other course to follow except to commit to a juvenile reformatory. The work of our children's courts has eliminated the more hopeful cases from our institutions. The result has been a very noticeable deterioration in the general character and quality of those who are now committed. Few appreciate the increased difficulties and new problems these changed and changing conditions force upon those charged with the administration of our reformatory and corrective institutions. It is a serious question as to whether or not the very structure of our institutions, the arrangement and character of buildings, must not be modified to meet these newer requirements. Certainly they must be built and organized in such a way as to teach those committed to their care self-control, obedience to lawful authority, respect for the rights and property of others and to train them mentally and industrially. No training of any kind can proceed until a reasonable self-control and obedience to authority are established.

Another influence that we shall ultimately have to take into account is the assumption that a child under the age of sixteen is not responsible for his or her acts. No longer in New York and possibly elsewhere are children under sixteen years of age tried for crime. It seems, and it *is,* absurd to arbitrarily fix a chronological age limit *below which* all crime becomes merely a misdemeanor or, to use the latest phraseology, "juvenile delinquency," and *over which* crime is crime. A boy fifteen years and eleven months old in the city of New York may commit a burglary or a robbery, or assault, or some other equally serious offense. Under our present law whatever the offense, he is charged with "Juvenile Delinquency." If one month later the same boy commits the same offense he is, in the eyes of the law, guilty of a felony and may be committed to a reformatory or to a State prison. Under our law, in New York, all boys committed to the House of Refuge are between the ages of twelve and sixteen years and come under our jurisdiction during their minority. They may be paroled when they have attained a certain standing as regards conduct and schooling. After parole they are subject to supervision until twenty-one years of age. We are careful in paroling boys to see that satisfactory work is secured. This work is investigated by our parole officers and is approved before a parole is granted. Parole boys are not permitted to change their employment without consulting the superintendent. Every incentive is given to make good. It happens frequently that boys are returned to the institution for violation of parole, some of them after having been on parole for two or three or more years. No parole system can be efficient unless there is in the mind of the boy a certainty that the violation of parole will result in his return. We are supervising now more than 1,200 boys on parole and we continue our supervision until they are twenty-one years of age; after that age our legal responsibility ceases.

The boy who prior to his sixteenth year has shown such pronounced criminal tendencies, as to make it necessary for him to be committed to an institution and who during his life in the institution and subsequently on parole continues to show these same tendencies, must under our law be released from all supervision when he attains his majority. We seem to assume that any boy or young man however vicious, however dangerous he may have been up to that age, is entitled to a sudden and arbitrary release from all supervision and authority. The law that makes it necessary to find him guilty at the age of fifteen and a half of "juvenile delinquency" and thereby very properly seeks to keep his record free from the stigma of crime, makes it impossible during his minority to transfer him to an adult reformatory or to a State prison, unless during that period and after his sixteenth birthday he commits a felony. If during this whole period he shows the most pronounced criminal tendencies and gives other evidence of being a dangerous element in and outside of the institution, nevertheless at the age of twenty-one the law arbitrarily releases him from custody and supervision. With the development of our institutional parole system and the probation work of the children's courts, it will become increasingly evident that age limits must be obliterated and the sole standard must be the development of character that will render the individual a positive benefit to society and that he shall not be released from custody and supervision so long as he continues to show himself unworthy of confidence and respect and incapable of self-control.

WORK OF THE YEAR

The usual repairs and improvements in and about the institution have been made by the boys under direction of their instructors. These included replastering and repainting second division halls and cells, new flooring and repainting in first division dining-rooms and primary playroom, quarantine quarters repainted, relining combustion chambers under battery of boilers, overhauling the plumbing, repairing roofs, new washing troughs in first and second division bathrooms, and these rooms repainted; repainting matron's quarters, and many minor repairs engaging the various instructors and their boys. In addition, all of the domestic work of the institution, the manufacture of clothing, bedding, etc., has been done, as heretofore, by the boys.

Following the custom established last year, a special company from the military department, accompanied by our band, took part in a competitive drill, held April 23, 1910, at the Seventy-first Regiment N. G. N. Y. Armory at Thirty-fourth street, under the auspices of Company G, Capt. Harry Maslin. The company, commanded by Captain MacNulty, was awarded the first prize, a silver cup, which now keeps company with the one won the year before. No further comment is necessary bearing upon the efficiency of our military department.

Scholastic

The reduction in our population has made possible a reorganization of our schools, by which the primary classes are now accommodated in our main school building. The change will enable Miss Arnold, the principal, to keep more closely in touch with this branch of her work. Miss Arnold's report for the year is submitted herewith. I wish again to testify to her extraordinary zeal and ability in the conduct of her department. The annual school exhibit, held June 8–11, 1910, was highly creditable to her and the teachers who work under her immediate direction.

Health

The general health of the institution has been excellent. One death during the year was due to pneumonia and valvular disease of the heart. Dr. W. G. Eynon, our physician, Dr. W. W. Gilfillan, opthalmologist, and Dr. A. Walter Hermann, dental surgeon, have been prompt, faithful and efficient. Their several reports are presented herewith.

PAROLE DEPARTMENT

The most important work of the institution is that of our Parole department. It has been a source of great gratification to me, as I am sure it has been also to the Board, to note the development and success of this work. Convinced that short parole periods of supervision were unwise, our work was organized on a basis of supervision that should last as long as the law permitted, namely, during minority. To those who would criticize this period as being excessive and likely to work hardship to the boys, to make them restive and intolerant, I can only say that close observation during the past five years does not warrant any such statement. The monthly reports of the boys have been made, as a rule, very promptly and satisfactorily. They have not shown any great desire to be released from parole supervision; and I present as further evidence of the fact that our parole supervision has been properly adjusted, the more than 1,500 visits made to me during the past twelve months by paroled boys. Three-quarters of these visits were purely voluntary on the part of the boys. The credit for this condition of affairs is largely due to the parole officers. They have been tactful, sympathetic, resourceful and in every way deserving of the full confidence I have had in their integrity and efficiency. The results of the parole work of the past year are given in the statistical tables presented herewith, and similar statistics for the full period since the system was inaugurated in October, 1905.

Table XV gives the result of our parole work since its inception. Two thousand five hundred and five boys have been actually under supervision. Of these 914 are still reporting and doing well, and 237 were doing well when supervision expired; 1,073 have for one reason or another been unsatisfactory on parole. Of these, 791 have been returned to the institution (including 56 voluntary returns); 154 have been committed to other institutions or are now on trial, and in 128 cases supervision expired with the boys not doing well. In 281 cases out of 2,505 nothing is at present known. This means that 11.21 per cent. of our boys are out of touch with the institution, having left home, family moved, or for some other cause. Five hundred and six boys have attained their majority and have therefore passed from under supervision. At the time of expiration 237 of the 506 were doing well; 128

were doing badly, or were at the time in other institutions; while in 141 cases no information was at hand. It is only fair to state that of this latter number (141), 80 are boys who were paroled before October, 1905, which was before adequate parole supervision had been established. Taking only the cases of these 506 boys who have graduated from our supervision, present records enable us to account for only 46.84 per cent. who were known to be doing well. In making this statement we are not crediting ourselves with probable satisfactory cases; any boy concerning whom definite information is not at hand is placed in the unsatisfactory class.

Table XIV gives the number of months each boy who was returned for violation of parole had been out of the institution. It illustrates in a forceful manner the fallacy of short parole periods. Of the 202 boys returned for violation of parole, 49 were out of the institution more than a year and 18 of them more than two years.

Table XIII gives the causes for the return of 202 delinquents. It shows that 36.16 per cent. were returned for crime (burglary, larceny, forgery, robbery, picking pockets, and receiving stolen property). Of the total number of Protestant boys on parole 09.26 per cent. were returned for violation; of the whole number of Catholic boys, 14.04 per cent.; of the Jewish boys 14.66 per cent.

We have had much invaluable help from voluntary officers, " Big Brothers," and probation officers of the several courts. They have supplemented the work of our parole officers with whom they have co-operated heartily.

GENERAL

The institution has been continued as a lecture center by the New York board of education. We have had weekly lectures on Friday nights on miscellaneous topics, attended by all of the boys.

The religious work of the institution has been continued as heretofore. Regular services are held on Sunday by the three chaplains, Rev. S. Roosevelt, Protestant chaplain; Rev. Frederick H. Grewen, S. J., Catholic chaplain; and Rev. Dr. Jacob Goldstein, Jewish rabbi.

A Sunday school is conducted also for each of the three services. The Protestant school is conducted by the Brotherhood of St. Andrew men, under direction of Mr. Chas. F. Minor; the Catholic Sunday School by voluntary teachers directed by Mr. J. P. Murphy, and the Jewish Sunday School by a corps of teachers, under the direction of Mrs. Bertha Hollander. All of these voluntary workers have performed important and valuable service. I have had their hearty co-operation in the administration of the institution.

The generous contributions made by the publishers of the leading magazines are gratefully acknowledged. These have been secured for us through the interest of Mr. Martin Blum, a willing voluntary worker, to whom also I extend sincere thanks. Almost every month we have received, through this channel, large quantities of recent issues of the magazines, and they have been of much service, instruction and entertainment to the boys.

I cannot close this, my sixth report, and the last as your superintendent, without a word of commendation and appreciation for the officers of the institution who have worked with me faithfully and loyally during the year, and most of them from the beginning of my superintendency. Whatever has been accomplished has been due to their faithfulness and interest in their work.

On June 10, 1910, I presented my resignation as follows:

"*To the President and Board of Managers of the New York House of Refuge:*

"GENTLEMEN.— On June 6th I was tendered the position of secretary of the New Jersey State Charities Aid Association. The acceptance of that office necessitates my relinquishing the work in which I have been engaged here since January 1, 1905. I cannot do so without stating briefly the reasons that impel me to resign the office of superintendent of the House of Refuge — a position in which I have received at your hands every possible consideration, unfailing sympathy and loyal support, and to leave a work that has my deep interest and to which I have given my best devotion. I find myself hopelessly out of accord with the policies of the State as regards the present fiscal administration of its charitable institutions. The picayune and parsimonious policy now pursued at Albany saps the energy and discourages all initiative on the part of superintendents — weakens their authority without relieving them of their responsibility. Realizing fully the necessity for a general supervision by the State of its institutions, I find myself out of sympathy with a system based on distrust, suspicion, dictatorial, and which by its methods encourages unrest and disloyalty, among inmates and officers alike; thus becoming a positive menace to their welfare when it should be their greatest source of helpfulness and encouragement. In view of these conditions I feel that I cannot, in justice to you, the institution and myself, continue to serve as your superintendent. Dissatisfaction with conditions under which we labor, and that we are powerless to correct, interferes with efficient work. I find myself in that situation. I therefore tender my resignation, to take effect on or before October 15, 1910, and beg that you accept the same. Whatever success has attended the administration of the Refuge during the past five and a half years has been due to your constant sympathy, encouragement and support. I cannot look forward to the severing of our official relations without deep and genuine regret, nor without expressing to you as a board, and individually, my heartfelt thanks for your uniform kindness to me and my family."

To the foregoing I have nothing to add except to again express to you my sense of obligation for the support so uniformly accorded me by each member of the Board and your unfailing kindness to me and my family.

Respectfully submitted,

JOSEPH P. BYERS,

Superintendent.

TABLE I

Showing the number of children received and disposed of during the year ending September 30, 1910

Since the opening of the institution January 1, 1825, the whole number of children under its care has been 31,673.

Boys	26,667
Girls	5,006
	31,673

On the first day of October, 1909, the number of inmates were as follows:

White boys	555	
Colored boys.	63	
		618
There were received since:		
White boys	316	
Colored boys	28	
		344
Total in the house during the year		962
There were disposed of during the year:		
White boys	502	
Colored boys	47	
		549
Leaving in the house on the first of October, 1910:		
White boys	369	
Colored boys	44	
		413

Table II

Showing the sources whence 344 children were received during the year ending September 30, 1910

WHERE FROM.	White boys.	Colored boys.	Total.
New York county	81	7	88
Kings county	15	3	18
Richmond county	2	......	2
Suffolk county	9	3	12
Westchester county	3	......	3
Orange county	2	......	2
Rockland county	2	......	2
Dutchess county	3	......	3
Sullivan county	1	......	1
Schoharie county	1	......	1
Greene county	1	......	1
Ulster county	1	1	2
	121	14	135
Returned	196	13	209
	317	27	344

Table III

Showing the parentage of 135 children received during the year ending September 30, 1910

	Protestant.	Catholic.	Hebrew.	Total.
American	11	14	1	26
American, colored	14	....	....	14
Austrian	1	1	7	9
Canadian	....	1	....	1
English	1	....	....	1
French	....	1	....	1
German	....	3	3	6
Indian, West, colored	1	....	....	1
Irish	....	10	....	10
Italian	....	28	....	28
Roumanian	....	....	1	1
Russian	....	1	21	22
Slavonian	....	1	....	1
Syrian	....	....	1	1
Mixed:				
One parent American	....	5	1	6
Both parents Foreign	1	4	2	7
	29	69	37	135

TABLE IV

Showing the offenses of 135 children received during the year ending September 30, 1910

Section Penal Law violated.	OFFENSE DESCRIBED.	Number.	Total.
	Non-Criminal Offenses.		
486	No Proper Guardianship	19	
486	Ungovernable	7	
486	Disorderly Child	10	
	Disorderly Conduct	14	
1990	Riding Freight Trains	1	
	Vagrancy	1	
			52
	Criminal Offenses.		
243	Assault, second degree	1	
	Assault, second degree	1	
	Burglary	2	
	Burglary accomplice in	1	
404	Burglary, third degree	14	
	Burglary, third degree	4	
	Concealed Weapons, carrying	1	
405	Entering Building Unlawfully	1	
	Juvenile Delinquency	17	
1298	Larceny, Petit	10	
	Larceny, Petit	11	
1294	Larceny, Grand, first degree	1	
1296	Larceny, Grand, second degree	4	
	Larceny, third degree	4	
	Poisoning Animal, wantonly	1	
43	Pushing and Jostling	8	
2124	Robbery, first degree	2	
			83
			135

TABLE V

Comparing criminal offenses with vagrancy or truancy and being disorderly

YEAR.	Whole No. of new commitments.	Committed for crime.	Per cent for crime.	Committed for vagrancy, disorderly, truancy.	Per cent for vagrancy, disorderly, truancy.
1875	638	390	61	248	39
1876	788	364	46	424	54
1877	699	344	49	355	54
1878	625	309	46	316	51
1879	368	482	50	186	50
1880	547	232	42	315	57
1881	512	241	47.5	271	35.5
1882	655	300	46	355	54
1883	551	285	52	266	48
1884	529	240	45	289	54
1885	491	246	50.5	245	50.5
1886	446	207	26	238	53
1887	433	207	48.5	226	52.5
1888	330	167	50	163	49
1889	360	163	45.66	197	55.33
1890	275	127	46	148	45
1891	269	126	47	143	53
1892	280	120	42	160	57
1893	319	140	44.85	179	56.14
1894	336	131	39	205	61
1895	503	181	36	322	64
1896	578	183	31	395	68
1897	471	234	49.66	237	50.34
1898	476	214	45.7	262	55.3
1899	423	231	54	192	54
1900	433	217	50.5	216	50.5
1901	466	244	52	222	47
1902	230	247	57.3	183	42.7
1903	547	329	60.5	218	39.5
1904	417	276	66.1	141	34.9
1905	358	242	68	116	32
1906	301	199	66	102	34
1907	283	181	64	102	36
1908	379	246	65	133	35
1909	275	169	62	106	38
1910	135	83	61.4	52	38.6

TABLE VI

Showing the social condition of the family, character of the home, habits and antecedents of the children before commitment

Whole number of new commitments	135
1. Social conditions of the families:	
Father and mother living	87
Father and stepmother living	14
Father living	7
Stepfather and mother living	1
Mother living	19
Both parents dead	7
Parents separated	9
Temperate fathers and stepfathers	96

Temperate mothers and stepmothers	119
Intemperate fathers and stepfathers	14
Intemperate mothers and stepmothers	3

2. Character of homes:

Excellent	13
Good	39
Fair	40
Poor	25
Have no homes	10
Unknown	8

3. Habits and antecedents of children before their commitment:

Attended school regularly	62
Attended school irregularly or not at all	2
Were regularly employed	71
Were arrested before	115
Had been inmates of other institutions	60

PER CENT SUMMARY OF TABLE VI

	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Temperate fathers	49	63	71	62	78	92	87	81	87	88
Temperate mothers	76	80	82	72	92	94	97	98	97	99
Irregular school attendance	28	39	36	44	48	.....	.....	7.4	2.4	15
Idle	19	51	54	47	23	33	.....	6.9	9.4	.....
Truants	62	45	47	53	56	.....	.....	.....	.....	.....
Previously arrested	53	33	47	41	49	78	68	82.3	80	84
Were in other institutions	31	31	33	30	38	52	57	39	44	44

TABLE VII

Showing the disposition of 549 *boys during the year ending September* 30, 1910

	White boys.	Colored boys.	Total.
Paroled to friends	471	35	506
Paroled to hire	21	9	30
Transferred to other institutions	1	0	1
Transferred to hospitals	1	1	2
Escaped *	4	......	4
Discharged on appeal	1	......	1
Returned to court for resentence	2	......	2
Deported	2	......	2
Died	1	......	1
Total	504	45	549

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*Of the four boys who escaped during the year, one has since been arrested and sent to the Elmira Reformatory; two returned.

TABLE VIII

Showing the length of time those disposed of during the year ending September 30, 1910, had been in the House

PART 1.— BOYS WHO HAD BEEN COMMITTED HERE FOR THE FIRST TIME.

Were in less than 1 month	1
Were in 2 months	1
Were in 3 months	1
Were in 4 months	1
Were in 5 months	2
Were in 9 months	2
Were in 10 months	1
Were in 11 months	1
Were in 12 months	2
Were in 15½ months	8
Were in 16 months	59
Were in 17 months	60
Were in 18 months	35
Were in 19 months	29
Were in 20 months	30
Were in 21 months	22
Were in 22 months	18
Were in 23 months	13
Were in 24 months	16
Were in 25 months	9
Were in 26 months	6
Were in 27 months	2
Were in 28 months	1
Were in 29 months	1
Were in 30 months	1
Were in 31 months	3
Were in 32 months	3
Were in 34 months	5
Were in 35 months	1
Were in 36 months	1
Were in 37 months	1
Were in 38 months	1
Were in 42 months	1
Total	338

Average time in the House, 19 months and 9 days.

PART 2.— BOYS WHO HAD BEEN RETURNED FOR VIOLATION OF PAROLE.

Were in less than 1 month	17
Were in 1 month	34
Were in 2 months	11
Were in 3 months	23
Were in 4 months	24
Were in 5 months	13
Were in 6 months	14
Were in 7 months	3
Were in 8 months	6
Were in 9 months	5
Were in 10 months	6
Were in 12 months	3
Were in 13 months	4
Were in 14 months	7
Were in 15 months	4
Were in 16 months	10
Were in 17 months	7
Were in 18 months	7
Were in 19 months	5
Were in 20 months	3
Were in 22 months	1
Were in 23 months	1
Were in 24 months	1
Were in 28 months	1
Were in 30 months	1
Total	211

Average time in House, 6 months and 27 days.

TABLE IX

Showing the number of inmates weekly for the year ending September 30, 1910

DATE.	Total boys.	DATE.	Total boys.
Oct. 7	611	April 7	490
Oct. 14	615	April 14	489
Oct. 21	599	April 21	480
Oct. 28	615	April 28	476
Nov. 4	609	May 5	475
Nov. 11	607	May 12	477
Nov. 18	600	May 19	478
Nov. 25	595	May 26	470
Dec. 2	582	June 2	468
Dec. 9	576	June 9	467
Dec. 16	571	June 16	473
Dec. 23	571	June 23	467
Dec. 30	561	June 30	466
Jan. 6	545	July 7	462
Jan. 13	541	July 14	459
Jan. 20	540	July 21	459
Jan. 27	536	July 28	451
Feb. 3	527	Aug. 4	446
Feb. 10	524	Aug. 11	434
Feb. 17	519	Aug. 18	429
Feb. 24	513	Aug. 25	422
Mar. 3	507	Sept. 1	417
Mar. 10	509	Sept. 8	409
Mar. 17	499	Sept. 15	406
Mar. 24	502	Sept. 22	405
Mar. 31	485	Sept. 29	410

Daily average attendance, 505.22.

TABLE X

Showing nativity percentage of the total number of inmates in the house on dates given

	SEPT. 30, 1906.		SEPT. 30, 1907.		SEPT. 30, 1908.		SEPT. 30, 1909.		SEPT. 30, 1910.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Russia	155		137		225		217		113	
Poland	4	25.85	4	24.00		31.94	3	35.60	3	28.09
Italy	71	11.54	88	15.00	92	12.83	66	10.68	61	14.77
Germany	61	9.92	57	9.60	47	6.56	39	6.31	26	6.29
Ireland	43	7.00	48	8.10	46	6.42	33	5.34	22	5.33
Austria	30		28		44		60		35	
Hungary	11		7		15		10		2	
Slavonia	1		0		1		1		1	
Bohemia	1		2		1		1		3	
Roumania	5	7.80	6	7.30	15	10.59	17	14.40	9	12.11
Canada	5		2		2				1	
England	6		8		18		6		2	
France	2		3		3		1		3	
Scotland	4		1		4		2		0	
Switzerland	1		1		1		1		1	
Norway	3		2		3		3		2	
Sweden	2		1		1		1		0	
Spain	1		1		1		0		0	
Cuba	0		1		1		1		1	
Denmark	2		0		0		0		0	
Greece	0		1		1		0		0	
Holland	0		1		0		0	2.59	0	
		423		3.80		4.88				2.42
American, white	15	18.70	102	17.00	87	12.13	68	11.00	60	14.53
American, mixed (one parent United States)	34	5.53	33	5.00	27	3.77	25	4.05	26	6.29
American, colored	58		57		77		62		41	10.17
West India, colored	0		3		0		0		1	
Cuban, colored	0	9.43	1	10.20	1	10.88	0	10.03	0	
	615	100.00	595	100.00	717	100.00	618	100.00	413	100.00

Table XI

Showing nativity of inmates in the institution September 30, 1910
Analysis in detail of Table X

NATIVITY OF BOY.	Parents.	First time.	Re-turned.	Total.	
Russia	Russia	18	18	36	
Russia	Russia-Poland	2	......	2	
United States	Russia	45	23	68	
England	Russia	2	......	2	
England	England-Russia	1	......	1	
United States	England-Russia	1	......	1	
United States	Russia-Germany	1	......	1	
United States	Russia-Hungary	1	......	1	
United States	Russia-Austria	......	1	1	113
United States	Poland	2	1	3	3
Italy	Italy	13	7	20	
United States	Italy	31	9	40	116
Brazil	Italy	1	......	1	61
Germany	Germany	3	2	5	
United States	Germany	13	4	17	
United States	Germany-Austria	1	......	1	
England	Germany	1	......	1	
United States	Germany-England	1	......	1	
United States	Germany-Ireland	1	......	1	26
United States	Ireland	16	5	21	
United States	Ireland-Germany	1	......	1	22
Austria	Austria	10	2	12	
United States	Austria	14	4	18	
United States	Austria-Russia	1	......	1	
United States	Austria-Germany	1	......	1	
England	Austria	1	......	1	
United States	Austria-Hungary	2	......	2	
Hungary	Hungary	......	1	1	
United States	Hungary	1	......	1	
United States	Slavonia	1	......	1	
United States	Bohemia	3	......	3	
Roumania	Roumania	4	2	6	
United States	Roumania-Germany	......	1	1	
Roumania	Roumania-Russia	......	1	1	
Syria	Syria	1	......	1	50
United States	Canada	1	......	1	
England	England	1	......	1	
France	France	1	......	1	
United States	England-Ireland	......	2	2	
United States	France-Belgium	1	......	1	
Switzerland	Switzerland	......	1	1	
United States	Norway	2	......	2	
Cuba	Cuba	1	......	1	10
West India	West India	1	......	1	1
United States	United States (white)	44	16	60	60
One parent United States.					
United States	England-United States	2	1	3	
United States	United States-Ireland	2	1	3	
United States	Ireland-United States	1	3	4	
United States	Russia-United States	1	......	1	
United States	Bohemia-United States	1	......	1	
United States	United States-Germany	3	2	5	
United States	United States-England	1	......	1	
United States	Germany-United States	2	......	2	
United States	United States-Scotland	......	1	1	
United States	Scotland-United States	......	2	2	
United States	United States-Canada	3	......	3	26
United States (colored)	United States (colored)	33	8	41	41
Total census Sept. 30, 1910	......	......	......	......	413

Note.— In column giving nativity of parents, the nativity of the father is indicated first and that of the mother second.

Table XII

Showing previous records of the 135 new commitments for the year ending September 30, 1910

20 were never arrested
40 were arrested once or 40 individual arrests
22 were arrested twice or 44 individual arrests
22 were arrested three times or 66 individual arrests
17 were arrested four times or 68 individual arrests
6 were arrested five times or 30 individual arrests
4 were arrested six times or 24 individual arrests
4 were arrested seven times or 28 individual arrests

135 Total 300

Court disposition:
19 court fines
48 court paroles
90 commitments to institutions (60 individual boys)
143 discharges or suspension of sentence

300

Distribution

To corrective institutions:		
New York Catholic Protectory	42	
New York Juvenile Asylum	3	
New York Truant School	9	
Brooklyn Disciplinary Training School	10	
Brooklyn Truant School	5	
Jewish Protectory and Aid Society	2	
New Jersey State Home	1	
County jails	1	
Workhouse	1	
Berkshire Industrial Farm	1	
		75
To non-corrective institutions:		
White Plains Home	2	
Colored Orphan Asylum	2	
Children's Home, Yaphank, L. I.	1	

Children's Home, Albany	2	
Children's Home, Buffalo	4	
Children's Home, Peekskill	1	
St. Francis' Home	1	
Father Drumgooles	2	
		15
Total individual commitments		90

TABLE XIII

Showing causes contributing to return of boys during the year ending September 30, 1910

Returned and held:	Recommitted.	Other sources.
Burglary, attempt, third degree	....	2
Burglary	1	6
Larceny	....	3
Larceny, grand	4	5
Larceny, petit	4	12
Receiving stolen property	....	1
Picking pockets, attempted	2	16
Unlawful entry	....	1
Carrying concealed weapons	....	3
Improper guardianship	....	1
Not working	....	4
Vagrancy	....	2
Riding freight trains	....	1
Carrying burglar tools	....	1
Assault	1	1
Felonious assault	1	....
Disorderly conduct	2	5
Parents' complaint	....	22
Leaving home	....	11
Not reporting	....	4
Sending false reports	....	13
Placed out and ran away	....	1
	15	115
		130

Returned and not held:

Sentenced to other institutions and then returned	8
Not reporting	4
Sending false reports	11
Placed out and returned unsatisfactory	3
Arrested and acquitted	10
Not working	3
Carrying concealed weapons	1
Riding freight trains	1
Placed out and left	2
Disorderly conduct	4
Parents' complaint	6
Leaving home	2
	55

Return and held	130
Returned and not held	55
Returned voluntarily	19
Escaped and returned	5
	209

	Returned.	Per cent of total returned.	Per cent of total on parole.
Protestant	35	16.74	9.26
Catholic	74	35.41	14.04
Hebrew	100	47.85	14.66

Seventy-three or 36.16 per cent of the boys in the foregoing table were returned for crime committed after their parole, that is, for violation of the Penal Laws of the State of New York.

TABLE XIV

Showing the length of time returned boys have been out of the institution

MONTHS.	Recommitted.	Returned and held.	Returned and not held.	Returned voluntarily.
Less than 1	....	1	5	3
1	1	5	1	2
2	2	6	2	2
3	3	3	5	....
4	....	14	3	1
5	....	7	3	1
6	2	12	5	1
7	2	12	2	....
8	1	6	2	1
9	....	14	2	....
10	....	3	1	2
11	....	6	3	....
12	1	1	1	3
13	....	5	3	....
14	....	1	2	....
15	1	3	....	....
16	....	1	....	....
17	....	1	2	....
18	....	2	1	....
19	....	1	2	....
20	....	1	1	1
21	....	1	2	....
22	....	....	....	1
24	....	1	2	....
26	....	2	....	1
29	....	1	1	....
30	....	1	....	....
31	....	1	2	....
33	....	1	1	....
34	....	1	1	....
35	....	....	....	....
40	....	....	....	....
52	....	1	....	....
....	*2	....	....	....
	15	115	55	19

Were on parole, less than six months	90 or 44.55 per cent.
Were on parole, more than six months and less than one year	63 or 31.19 per cent.
Were on parole, more than one year and less than two years	31 or 15.35 per cent.
Were on parole, more than two years	18 or 8.91 per cent.
	202

* Have been previously released, not under parole obligations.

Table XV

Showing present status of boys released since January 1, 1905

	Jan. 1, 1905, to Sept. 30, 1905.			Oct. 1, 1905, to Sept. 30, 1906.			Oct. 1, 1906, to Sept. 30, 1907.			Oct. 1, 1907, to Sept. 30, 1908.			Oct. 1, 1908, to Sept. 30, 1909.			Oct. 1, 1909, to Sept. 30, 1910.			Recapitulation grand total.		
Total number released			430			377			467			424			575			549			2822
Escaped	17			7			19			8			2			4			57	*	
Unfit subjects	4			10			6			4			4			4			32		
Deported	0			1			1			0			13			2			17		
Writs of habeas corpus	0			1			1			4			3			2			11		
Returned to court for resentence	124			6			5			5			12			2			154		
Died	2			0			2			4			0			1			9		
Discharged by board of managers	0			0			0			1			1			0			2		
Died, insane or feeble-minded since parole	4			4			6			5			2			1			22		
Returned to home country since parole	0			3			6			4			0			0			13		
			151			32			46			35			37			16			317
Total actually under supervision			279			345			421			389			538			533			2505
Doing Well.																					
Still reporting		8			38			112			119			244			393			914	
Supervision expired		67			78			44			24			20			4			237	
			75			116			156			143			264			397			1151
Not Doing Well.																					
By final reports, supervision expired	5			2			8			5			5			2			27		
In other institutions, supervision expired	36			26			23			13			3			0			101		
		41			28			31			18			8			2			128	
Returned for violation of parole	73			146			156			145			146			69			735		
Returned voluntarily	1			0			13			15			14			13			56		
		74			146			169			160			160			82			791	
Now in:																					
State prison	2			1			7			10			5			3			28		
Elmira Reformatory	0			4			16			21			25			11			77		
New York County Penitentiary	1			0			0			2			14			6			23		
New York City Reformatory	0			0			0			0			1			2			3		
Washington State Reformatory	0			0			1			0			0			0			1		
United States Penitentiary	0			0			1			0			0			0			1		
Workhouse	0			0			0			1			0			2			3		
Washington, D. C., Jail	0			0			0			0			1			0			1		
New Jersey State Reformatory	0			0			0			0			1			0			1		
Lancaster, Ohio, Reformatory	0			0			0			0			1			0			1		
Hudson County, N. J., Penitentiary	0			0			0			0			1			0			1		

Michigan State Prison	0			0			0			0			1			0			1		
San Francisco, California, Jail	0			0			0			0			0			1			1		
Catholic Protectory	0			0			0			0			0			1			1		
Under arrest, awaiting trial	0			0			0			0			4			7			11		
		3			5			25			31			54			33			151	
			118			179			225			212			222			117			1073
UNKNOWN.																					
Supervision expired, no trace		80			39			13			6			3		0	0			141	
Delinquent, left home	1			5			13			20			40			13			92		
Delinquent, family moved	5			6			14			8			9			6			48		
		6			11			27			28			49			19			140	
			86			50			40			31			52			19			281
Total			279			315			421			389			538			533			2505

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*All except 10 were recaptured or sent to other institutions; of these, 6 are beyond supervision.

TABLE XVI

An analysis of Table XIII, showing individual paroles and present status

Whole number of paroles from January 1, 1905, to September 30, 1910		2,822
Total number released without parole obligations	282	
Total number released from parole obligations through death, insanity, feeble-mindedness or returned to home country	35	
Number of re-paroles	670	
		987
Total individual boys paroled		1,835

Of the 1,835 individuals paroled there were when supervision expired:

	Doing well.	Not doing well.
On final report	237	27
In other institutions	......	101
Unknown	......	141
Of the 1,835 individuals paroled still under supervision there are:		
Still reporting	914	......
Delinquent, return ordered	......	140
In State prisons	......	29
In State reformatories	......	83
In penitentiaries and jails	......	30
In Catholic Protectory	......	1
Under arrest, awaiting trial	......	11
Returned and still in house	......	121
	1,151 or 62.7%	684 or 37.3%

TABLE XVII

Showing previous record of the 1,835 individual paroles.

Showing previous arrests

	DOING WELL.		NOT DOING WELL.				
	Supervision expired.	Still reporting.	Supervision expired.	Delinquent.	In other institutions	Returned and still in house.	Total.
Were never arrested	78	233	89	43	18	15	476
Arrested once	93	290	96	46	61	38	624
Arrested twice	46	174	52	31	33	27	363
Arrested three times	12	108	25	15	26	18	204
Arrested four times	5	58	4	1	5	9	82
Arrested five times	2	28	1	4	7	11	53
Arrested six times	1	13	1	......	......	1	16
Arrested seven times	......	6	......	......	4	......	10
Arrested eight times	......	3	......	......	......	1	4
Arrested nine times	......	1	......	......	......	......	1
Arrested thirteen times	......	......	1	......	......	......	1
Arrested fourteen times	......	......	......	......	......	1	1
	237	914	269	140	154	121	1,835

Showing Times in House of Refuge

Were in house of refuge once	144	749	176	113	117	......	1,299
Were in house of refuge twice	66	135	63	18	30	94	406
Were in house of refuge three times	21	26	22	5	5	25	104
Were in house of refuge four times	5	2	8	4	2	1	22
Were in house of refuge five times	1	1	......	......	......	1	3
Were in house of refuge six times	......	1	......	......	......	......	1
	237	914	269	140	154	121	1,835

TABLE XVIII

Showing institutional record of the 1,835 individual paroles

CORRECTIVE INSTITUTIONS.	DOING WELL.		NOT DOING WELL.				
	Supervision expired.	Still reporting.	Supervision expired.	Delinquents.	In other institutions.	Returned and still in house.	Totals.
Catholic Protectory	36	175	43	20	37	39	350
Catholic Protectory and Juvenile Asylum	3	6	2	2	....	2	15
Catholic Protectory and Truant School	1	12	2	1	4	2	22
Catholic Protectory and Brooklyn Training School	......	3	......	......	1	3	7
Catholic Protectory, Juvenile Asylum and Truant School	......	4	......	......	1	.....	
Catholic Protectory, Truant School and White Plains Home	......	1	......	......	......	.....	1
Catholic Protectory, Truant School and Brooklyn Training School	......	1	......	......	......	......	1

TABLE XVIII (Continued)

CORRECTIVE INSTITUTIONS.	DOING WELL.		NOT DOING WELL.				Totals.
	Supervision expired.	Still reporting.	Supervision expired.	Delinquents.	In other institutions.	Returned and still in house.	
Catholic Protectory and Work House	1	2	2	......	......	......	5
Catholic Protectory and Father Drumgoole's	......	2	3	1	2	......	8
Catholic Protectory and County Jail	2	......	......	......	......	......	2
Catholic Protectory and Penitentiary	1	1	......	......	......	......	2
Catholic Protectory and Jewish Protectory	1	2	......	......	1	......	4
Catholic Protectory and White Plains Home	1	1	......	......	......	......	2
Catholic Protectory and Farm School	1	1	......	......	......	......	2
Catholic Protectory and Tarrytown Home	1	1	......	......	......	......	2
Catholic Protectory and Sparkhill Home	1	1	......	......	......	......	2
Catholic Protectory and Five Points Home	1	......	......	......	......	......	1
Catholic Protectory and St. Joseph's Home	1	1	......	......	......	......	2
Catholic Protectory and Orphan Asylum	5	1	......	......	......	......	6
Catholic Protectory and St. John's Home	1	......	......	......	......	1	2
Catholic Protectory and St. Dominic Home	1	1	......	......	......	......	2
Catholic Home for the Friendless	......	1	......	......	......	......	1
Juvenile Asylum	25	78	43	20	28	4	198
Juvenile Asylum and Workhouse	1	......	......	......	......	......	1
Juvenile Asylum and Truant School	1	7	3	3	2	1	17
Juvenile Asylum and Brooklyn Training School	1	4	......	......	......	......	5
Juvenile Asylum and Hebrew Sheltering Guardian Society	2	......	1	1	......	......	4
Juvenile and Hebrew Orphan Asylum	......	2	......	......	......	......	2
Juvenile Asylum and Orphan Asylum	......	......	1	......	1	......	2
Juvenile Asylum and Five Points Mission	......	2	......	......	......	......	2
Juvenile Asylum and Colored Orphan Asylum	......	1	......	......	......	......	1
Juvenile Asylum and White Plains Home	......	......	......	......	1	......	1
Juvenile Asylum and Farm School	1	1	1	......	......	......	3
Juvenile Asylum and Jewish Protectory and New York City Reformatory	......	1	......	......	......	......	1
Brooklyn Training School	1	18	1	1	6	5	32
Brooklyn Training and Truant Schools	......	2	......	1	......	1	4
Brooklyn Training School and Washington Reform School	......	1	......	......	......	......	1
Brooklyn Training School and Orphan Asylum	......	1	......	1	......	......	2
Brooklyn Training School and White Plains Home	......	......	......	......	1	......	1
Truant School	5	19	4	2	2	2	34
Truant School and Berkshire Industrial School	1	......	......	......	......	......	1
Truant School and Farm School	......	......	......	......	1	......	1
Truant School and White Plains Home	1	1	1	......	......	......	3
Truant School and George Junior Republic	......	......	1	......	......	......	1
Truant School and St. John's Home	......	......	1	......	......	......	1
Workhouse	3	......	6	2	1	......	12
County Jails	......	5	3	1	......	......	9
County Jails and Yaphank Home	......	1	......	......	......	......	1
Penitentiary	......	......	......	......	1	......	1
Penitentiary Farm School	......	......	1	......	......	......	1
Lyman School	......	......	......	1	......	......	1
Lyman School and Truant School	......	1	......	......	......	......	1
State Industrial School	......	......	1	......	1	......	2
State Industrial School and Troy Home	......	......	......	1	......	......	1
Cincinnati House of Refuge	......	......	......	1	......	......	1
New York City Reformatory	......	1	......	......	......	1	2
Elmira Reformatory	......	6	......	......	......	2	8
Boston Parental Training School	......	1	......	......	......	......	1
Total	100	370	120	59	91	63	803

TABLE XVIII (Continued)

NON-CORRECTIVE INSTITUTIONS.	DOING WELL.		NOT DOING WELL.				
	Supervision expired.	Still reporting.	Supervision expired.	Delinquents.	In other institutions.	Returned and still in house.	Totals.
Roman Catholic Orphan Asylum	1	......	1	......	......	......	2
Father Drumgooles	1	5	.....	1	1	......	8
Peekskill Home	1	1	1	2	......	......	5
Peekskill Home and White Plains	......	1	......	......	......	......	1
Roman Catholic Orphan Asylum, Buffalo	......	2	1	......	......	......	3
Sparkhill, N. Y. Home	......	1	1	......	......	......	2
St. Agnes Convent	......	1	......	......	......	......	1
Poughkeepsie Home and White Plains Home	......	1	......	......	......	......	1
St. Joseph's Home	1	......	......	......	......	......	1
St. John's Home and St. Vincent's Home	1	......	......	......	......	......	1
St. Michael's Home	......	......	1	......	......	......	1
St. Michael's Home and Peekskill Home	......	......	1	......	.....	......	1
Tarrytown Home	......	......	......	1	......	......	1
White Plains Home	4	16	1	2	5	2	30
Farm School	2	2	2	1	......	1	8
Berkshire Industrial Home	1	1	1	......	......	......	3
Home for Friendless	......	......	......	1	......	......	1
Sterling Place Home	1	......	1	......	......	......	2
Five Points House of Industry	......	2	1	......	......	......	3
George Junior Republic	......	......	......	1	......	......	1
Colored Orphan Asylum	......	6	2	2	......	1	11
Wartburg Orphan Asylum	......	......	......	1	......	.....	1
Kingston Home	......	......	......	......	1	......	1
Yaphank Home	......	3	......	......	......	.....	3
German Odd Fellows Home	......	1	......	......	......	......	1
Bernardo Home, Cardiff, Wales, and Home Myrtle, Ont	......	1	......	......	......	.....	1
Hebrew Orphan Asylum	2	3	2	1	1	......	9
Hebrew Sheltering Guardian Society	......	1	1	......	......	1	3
Hebrew Orphan Asylum and Farm School	......	......	......	1	......	......	1
St. Gile's Home	......	......	......	......	......	1	1
St. John's Home	......	1	1	......	......	......	2
Totals	15	49	18	14	8	6	110

RECAPITULATION

	DOING WELL.		NOT DOING WELL.				
	Supervision expired.	Still reporting.	Supervision expired.	Delinquents.	In other institutions.	Returned and still in house.	Totals.
Have been in corrective institutions	82	351	110	55	85	62	745
Have been in non-corrective institutions	15	49	18	14	8	6	110
Have been in both corrective and non-corrective institutions	18	19	10	4	6	1	58
Have not been in any institutions	122	495	131	67	55	52	922
Totals	237	914	269	140	154	121	1,835

REPORT OF PAROLE DEPARTMENT

Joseph P. Byers, *Superintendent:*

Sir.— I have the honor to submit herewith my annual report for the year ending September 30, 1910:

Boys on parole October 1, 1909	1,053	
Paroled during the year	534	
		1,587

Divided as follows as to religion:

Protestant (23.81 per cent)	378	
Catholic (33.21 per cent)	527	
Hebrew (42.98 per cent)	682	
		1,587

During year:

Returned (see Table XIII)	204	
Died, insane or feeble-minded	3	
Supervision expired	172	
		379
Total under supervision October 1, 1910		1,208

Classified as follows:

Still reporting	914	
Delinquent	140	
In other institutions	154	
		1,208

Divided as follows as to religion:

	Still reporting.	Delinquent.	No other institutions.	Total.
Protestant (per cent 24.17)	210	47	35	292
Catholic (per cent. 32.29)	287	40	63	390
Hebrew (per cent 43.54)	417	53	56	526
Total	914	140	154	1,208

During the past year the number of boys on parole increased 155, bringing our total to 1,208. Of these 1,054 are being constantly supervised as far as it lies in our power to do so with our present force.

During the year 4,023 visits were made; this includes all special, work and home investigations. Home investigations are made as soon as possible after the boy's commitment to the institution and also previous to his being paroled. All offers of employment to inmates are investigated previous to parole. The accompanying of boys to and from the institution, such as those newly committed, sent to court as witnesses, to funerals and to secure employment take considerable time. During the past year a total of 505 boys have been accompanied in this manner.

We have also been endeavoring to supervise more closely those who live in the rural districts. This has been in part, accomplished but not as well as we would like. During the past year eighty-three visits were made to fifty-five cities and towns in the State of New York. Thirty-two visits were made in sixteen cities and towns in the State of New Jersey. Eleven visits were made in eight towns in the State of Connecticut. Four visits were made in three towns in the State of Massachusetts. Three trips were made to Philadelphia, Pa., and one to Detroit, Mich., for the purpose of returning boys who had violated their parole.

It will be seen from the foregoing that our present small parole force (four officers) is inadequate to accomplish the amount of work necessary in looking after this number of boys, scattered hither and thither. The need of additional parole officers is an imperative necessity. I hope that during the coming year this matter will be given careful consideration so that the ever increasing work may be successfully performed.

During the past year a total of 1,495 personal visits were made to you by paroled boys. Of this number 1,208 were purely voluntary visits, some of them came seeking advice and others to let you know how they were getting along.

The balance, 287, or 25 per cent. of the whole number, were boys, who upon investigation or other complaints, were ordered by the parole officers to report to you, as it was found that they were not doing as well as they should.

These visits were made principally on Sunday mornings, the time set apart for that purpose. This does not interfere with their work. These visits have benefited the boys a great deal and served to place many on the right path. The freedom with which they come shows that there is a kindly feeling toward the institution, and that they look upon it as a friend.

Tables 13 to 18, printed in this report, give statistics covering the work of the parole department since its inception.

Table 13, which gives the causes for the return of boys for violation of their parole, shows that 73 of the 200 boys returned to crime after their parole.

Nineteen boys returned voluntarily to the institution, requesting that they be taken care of until such time as suitable work and a home could be secured for them, or for having had some trouble at home which required investigation. This again illustrates that the boys look upon the institution as a friend.

Of the boys who were returned 55 were later re-paroled, either within a day or so, or held only until proper investigations could be made to ascertain whether or not they were doing well, it being deemed unnecessary to hold them after they had been advised and warned.

Table 14, which shows the number of months boys have been out on parole, before their return, points out very strongly the fallacy of a short, or even six months' parole system. One hundred and twelve, or 55.5 per cent. were out longer than six months, and almost 25 per cent. were out over a year.

Table 15 shows the present status of the whole number of boys released.

Table 16, which is an analysis of table 15, shows the following:

Since January 1, 1905, 1,835 individual boys were released under parole obligations, of which number 1,151, or 62.7 per cent., are doing well.

Out of 1,329, still under the age of twenty-one (1,108 under parole supervision and 121 in the institution for parole delinquency), 914, or 68.77 per cent. are doing well.

Of the 506 boys who are beyond the age of supervision, 237, or 46.84 per cent., were doing well when supervision expired. That our records show only a small percentage of boys doing well

(46.84 per cent.), is due to the fact that we have no definite data concerning 141 of these boys. These 141 are classed as not doing well. Two hundred and seventy-nine of the 506 were paroled before the organization of the present parole system, October 1, 1905.

There are 914 boys still reporting, as shown on table 16, as follows:

Living at home	760
Boarding	96
In United States army and navy	58

Tables 17 and 18 have been compiled for the purpose of showing the previons records of the 1,835 individuals boys paroled. Of this total, 1,359, or 74 per cent., had been arrested previous to their commitment to the Refuge.

A total of 913, or 49.75 per cent., had been in other institutions previous to their commitment to the Refuge (803 were in corrective institutions and 110 in non-corrective institutions).

At the present writing we have 140 boys included on our delinquent list whose present whereabouts are unknown, and of this number 92 have forsaken their homes, their parents and friends knowing nothing of them. That we are gradually reducing the number of boys classed as delinquents whose whereabouts is unknown will be seen by the following table:

Date.	Total on parole.	Whereabouts unknown.
October 1, 1906	506	133, or 26.28 per cent.
October 1, 1907	752	175, or 23.27 per cent.
October 1, 1908	830	158, or 19.03 per cent.
October 1, 1909	1,053	136, or 12.92 per cent.
October 1, 1910	1,208	140, or 11.59 per cent.

The total number of boys on parole has increased 138 per cent. since October 1, 1906.

Each boy is given printed instructions upon release and is required to make monthly, bi-monthly, or quarterly reports upon a blank form, one of which is mailed to him at the end of each month. (See appendix for facsimile of report blank.)

We owe thanks to the voluntary workers, to the Big Brothers, Children's Aid Society, and many others who have so ably assisted us during the year and who have rendered much valuable aid.

Respectfully submitted,
FREDERICK C. HELBING,
Chief Parole Officer.

September 30, 1910.

Note — Since this report was written and before going to press, an additional parole officer has been added to the force.

REPORT OF THE PHYSICIAN

To the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York:

Gentlemen.— The following report of the attending physician for the year ending September 30, 1910, is respectfully submitted. The total number of inmates in the institution during the past year was 962. The total cases of illness sufficiently severe to require treatment and detention in the hospital numbered 244, divided as follows: 101 from the first division, 126 from the second, and 17 from the third.

The following cases are worthy of mention:

	1st. div.	2d div.	3d div.	Total.
La Grippe	3	2	1	6
Quinsy	..	8	..	8
Bronchitis	1	1	..	2
Asthma	1	1	..	2
Pleurisy	1	..	..	1
Pneumonia	1	4	..	5
Tubercular glands	2	1	..	3
Acute pulmonary tuberculosis (transferred)	2	..	..	2
Chronic nephritis	1	..	..	1
Rheumatism	1	4	1	6
Catarrhal jaundice	1	..	..	1
Malaria	1	..	1	2
Neuralgia	..	2	..	2
Phlebitis	1	..	..	1
Proctitis	..	1	..	1
Cellulitis	..	..	1	1
Appendicitis	1	1	..	2
Cholera morbus	3	3	1	7
Ringworm	10	4	..	14

	1st. div.	2d div.	3rd div.	Total.
Scabies	4	7	2	13
Eczema	3	3	1	7
Acne	1	1	..	2
Pityriasis	2	1	..	3
German measles	1	..	..	1
Measles	1	..	..	1
Ivy poisoning	..	1	..	1
Bursitis	1	..	..	1
Valvular heart disease	1	3	..	4
Secondary syphilis (transferred)	..	1	..	1
Gonorrhœa	2	6	..	8
Orchitis	1	..	..	1
Hysteria	1	..	..	1
Epilepsy	..	1	..	1
Tonsilitis	23	33	5	61
Minor injuries	8	10	2	20
Scalp wounds	1	2	..	3
Stab wounds	1	2	..	3
Infected wound of foot	1	2	1	4
Infected knee	..	2	..	2
Sprained ankle	1	2	..	3
Sprained shoulder	..	1	..	1
Sprained wrist	2	2	..	4
Fracture of nasal bone	..	2	..	2
Fracture of radius	..	1	..	1
The following operations were performed:				
Circumcisions	3	2	..	5
Radical cure for hernia	..	1	..	1
Removal of adenoids	9	4	..	13
Removal of hypertrophied tonsils	4	3	1	8
Totals	101	126	17	244

We had one death during the year from pneumonia, complicating valvular disease of the heart.

The questions of hygiene and sanitation have received careful attention throughout the entire institution. The plumbing in the toilets and lavatories has been frequently inspected and kept clean and in good working order. The dormitories, halls and all other rooms occupied by the boys have been kept as clean and sanitary as possible. Special attention has been paid to the beds and bedding to keep them clean and comfortable. The lighting, particularly in the schoolrooms, has been satisfactory and the same is true of the heating. Each boy on admission has been given a physical and mental examination, of which a medical record has been kept, including the personal and family history. At intervals all of the inmates have received a systematic medical examination.

Strict quarantine of all new admissions for fourteen days has been maintained; on several occasions boys have been admitted during the incubation stage, of some contagious disease, showing the importance of rigidly maintaining this two weeks' quarantine.

As in the past, all cases of contagious eye diseases have been carefully segregated and provided with separate eating and washing utensils.

The children have been comfortably clothed and well fed during the past year, and plenty of time for play has been allowed. Generally speaking the health of the boys has been excellent during the year and they have a wholesome and contented appearance.

W. G. EYNON, M. D.,
Attending Physician.

September 30, 1910.

REPORT OF THE OPHTHALMOLOGIST

To the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York:

GENTLEMEN.— During my past year's service as attending oculist at the House of Refuge, the following cases have been treated:

Blepharitis marginalis	2
Cellulitis of lid	1
Chalazion (tumor of lid)	1
Conjunctivitis, acute	5
Conjunctivitis, chronic	3
Conjunctivitis, Phlyctenular	1
Corneal opacity	..
Ecchymosis of the conjunctiva	1
Dacryocystitis	1
Hordeolum (stye)	1
Phlyctenular keratitis	2
Divergent strabismus	1
Trachoma	29
Ulcerative keratitis	1

During the year 344 children were admitted into the house. Of this number 29 had trachoma, making a percentage of 8½. Last year the percentage was 8¾. In 1904 it was 17 per cent. During the year 52 cases were cured. At present we have 16 cases under treatment.

Every month each division is examined for trachoma. When cases of trachoma are found they are placed under treatment. Many times a case of trachoma will relapse and it is again placed under treatment.

All cases of trachoma have done well and eleven cases were operated on. Not a large number are in a condition for operation as the disease is too far progressed.

Great care is taken of the trachoma cases so that no spread of the disease is possible. Considering the class of boys we get our figures are very low. Active measures by the board of health has had much to do with our present low figures. The health board is active in all the public schools of the city and requires all trachoma cases treated.

The following operations have been performed:

Chalazion	1
Foreign body on the cornea removed	1
Hordeolum (stye)	1
Tenotomy	1
Tenotomy, with advancement	1

On the average I should say the sight of the inmates is better than one would expect to find it, showing that poor sight has nothing to do with crime. Quite a number of glasses have been ordered for those inmates who required them.

Respectfully submitted,
W. WHITEHEAD GILFILLAN, M. D.,
Attending Oculist,
31 West Fiftieth Street.

September 30, 1910.

REPORT OF THE DENTAL SURGEON

To the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York:

Gentlemen.— During my service as attending dental surgeon for the year ending September 30, 1910, 1,336 dental examinations were made.

One examination while inmate was in quarantine and one or more during the year.

There has been less filling and extracting this year, because a majority of the inmates were returned boys and their teeth were in very good condition, due to treatment when first committed.

The system of general examination and treatment in squads has been continued, thus keeping all mouths in good order while in the institution.

Operations classified as follows:

General examinations	1,336
Examinations where dental work was not required	324
Extractions teeth — principally first molars and temporary	118
Extractions, roots	331
Teeth filled with amalgam and cement	279
Teeth treated preparatory for filling	26
Bridges inserted	3
Bridges repaired	2
Partial upper denture (donated)	1
Dentures repaired	2
Alveolar abscesses treated	16

About twenty boys were treated between visits.

Respectfully submitted,
A. WALTER HERMANN, D. D. S.,
Attending Dental Surgeon.

September 30, 1910.

REPORT OF THE PRINCIPAL

To the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York:

Gentlemen.— During the year ending September 30, 1910, the work of the school moved along with little change from that of the previous year.

The topical work in history, which had proved such a success, was continued and a like plan was introduced in the work of geography, much study being given to our own city and state and many illustrated papers written.

We have always given time and attention to current events, but this last year in each class a special feature has been made of the news of the day and bulletin boards of generous size have been kept full of news items and pictures illustrating them. The teachers giving time and attention to this have felt more than repaid by the interest shown by the pupils, not only in this special feature, but in the increased interest in the general work of the class.

There has been a decided improvement in spelling, which is largely due to a greater use of the old fashioned oral spelling and spelling matches.

The usual exhibition took place in June and the quantity and quality of the work was fully equal to that of the year before.

At the time of the Hudson-Fulton celebration the New York *American* offered prizes to the school children of New York for compositions describing the achievements of these celebrated men. Our boys, encouraged by the success of last year, responded with enthusiasm and with such excellent work that one silver medal and 137 bronze medals were awarded us.

The individual instruction made possible by the smaller classes of this year has shown excellent results.

The difficulty in securing suitable teachers continues, and I would be glad if the salaries were raised to correspond more nearly to those of the public schools and a greater inducement offered to teachers capable of doing the difficult work of teaching under our exceptional conditions.

The library work still holds its important place in our work, and in July the pupils wrote papers answering these questions:

1. What five books in our library which you have read would you choose for a library of your own?
2. Name a book you like best and tell why?
3. What may be gained from a taste for reading?
4. What qualities are necessary in a book which boys will like?

The answers were most interesting and have been put on file.

The records show that 12,042 books were drawn during the eleven school months of the year.

During the year there were admitted to the school 344 boys, who were placed as follows:

	1st div.	2d div.	3d div.	Total.
First class	6	6	11	23
Second class	17	13	...	30
Third class	20	20	2	42
Fourth class	26	72	5	103
Fifth class	22	22	...	44
Sixth class	19	32	6	57
Seventh class	21	24	...	45
Totals	131	189	24	344

There were paroled during the year 506 boys from the following classes:

	1st div.	2d div.	3d div.	Total.
First class	1	...	3	4
Second class	9	8	...	17
Third class	28	32	9	69
Fourth class	52	83	6	141
Fifth class	38	43	...	81
Sixth class	30	44	34	108
Seventh class	39	47	...	86
Quarantine	..	...	...	43
Totals	197	257	52	549

The enrollment of the class on the last day of September was as follows:

	1st. div.	2d div.	3d div.	Total.
First class	..	3	8	11
Second class	16	11	...	27
Third class	23	27	6	56
Fourth class	37	31	8	76
Fifth class	43	32	...	75
Sixth class	32	26	9	67
Seventh class	38	36	...	74
Quarantine	..	...	...	2
Totals	189	166	31	413

Respectfully submitted,
ANNETTE M. ARNOLD,
Principal of Schools.

September 30, 1910.

EXTRACT FROM THE MINUTES OF THE MEETING OF THE BOARD OF MANAGERS, HELD ON THE SIXTH DAY OF OCTOBER, 1910:

At the monthly meeting of the Board of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York, held at the House of Refuge, Randall's Island, on October 6, 1910, the committee, consisting of Evert Jansen Wendell and Newbold Morris, appointed to draw resolutions on the resignation of Joseph P. Byers from the superintendency of the institution, presented the following report:

" On the first day of January, 1905, Joseph P. Byers assumed the position of Superintendent of the House of Refuge.

" During his incumbency of that office he has enjoyed the confidence and friendship of every member of the Board; and his voluntary resignation has been received by them with universal regret.

" His fairness; his sense of justice; his patience; and his desire never to spare himself in carrying out whatever policy seemed to him best for the interests of the Institution and of all connected with it, has entitled him to — and secured for him — the profound respect of the Board of Managers; the officers on his staff; and all the inmates of the House.

" Every department has improved appreciably, as a result of his unfailing care and good judgment; but especial stress should be laid upon the development of the Parole Department, to which he has devoted particular attention.

" The care and oversight of the wards who have left an institution is one of the most important elements in the development of their lives and characters. To this oversight Mr. Byers has devoted especial energy; and as a result, we believe, so far as the number on our staff will permit, our Parole system is second to that of no institution in the land.

" His personal influence on the boys who have left the House has been very great — encouragement being given to all to whom it was possible to extend it, and kindly firmness being shown to those who needed it as an aid to the strengthening of their characters to enable them to withstand, more successfully, future temptations and to help them on toward an honest and useful manhood.

"We wish to assure Mr. Byers of our deep regret at his departure; and also of our hope that he will meet with continued and increasing success in whatever career of usefulness the future holds in store for him."

On motion duly seconded, the report was accepted unanimously, and ordered spread, in full upon the minutes; and it was voted that a copy of the resolutions be duly engrossed and sent to Mr. Byers.

Attest:

A true copy from the records of the Board.

EVERT JANSEN WENDELL,
Secretary.

STATUTES AND REGULATIONS

UNDER WHICH BOYS ARE DETAINED IN THE NEW YORK HOUSE OF REFUGE

The House of Refuge is a reformatory institution, maintained by the managers under the provisions of chapter 126 of the Laws of 1824 (see section 4 of said act), and the acts amendatory thereto (chapter 241, Laws of 1860, and chapter 172, Laws of 1865).

For the purposes of the reformation of the children committed to their care, the managers under section 6 of chapter 126, Laws of 1824, have established a system for determining the period of detention of the inmates, which in substance is as follows:

A debit and credit account of marks is opened with each inmate as received, under which an inmate of ordinary and average good conduct becomes entitled to a parole after a detention for a period of eighteen months; such excess is due to the inmates' own conduct, which has resulted in the balance of marks being against him.

This period of detention has been established by the managers as being in their judgment productive of the most permanent and beneficial results in the reformation of the character and habits of the children committed to their care.

By a system of commutation adopted by the Board of Managers in March, 1900, an inmate for faultless conduct is given two weeks for every thirteen, which makes it possible to reduce the period stated by about two and a half months.

The foregoing system is never departed from except in cases presenting very special features. In such cases the discharge is only had by a vote of the Board of Managers.

Furthermore, it has been found that any departure from this system is productive among the children of a sense of favoritism or unjust discrimination, with the result that feeling themselves to be unjustly treated, their conduct, and consequently their mark account becomes demoralized.

Boys returned for violation of parole are held for such period as may be determined necessary to again fit them for parole. This period varies from a day or two for the investigation of their case, to three months of good conduct or to the full period of seventy-eight weeks of good conduct, as the nature of their violation and the circumstances of their case may justify.

The principal statutes under which commitments are made to the House of Refuge will be found in the Penal Laws of the State of New York, chapter 88 of the Laws of 1909, being chapter 40 of the Consolidated Laws of the State of New York (1909), sections 486, 2184 and 2186. See also the State Charities Laws, chapter 57 of the Laws of 1909, being chapter 55 of the Consolidated Laws of the State of New York (1909).

CHILDREN'S MENU

For the Week Ending June 22, 1910

Thursday, June 16, 1910

Breakfast — Coffee with milk and sugar, bread, peaches.

Dinner — Bread, corned beef hash containing corned beef, potatoes, onions, cold slaw.

Supper — Bread, milk, bread pudding containing milk, sugar and currants.

Friday, June 17, 1910

Breakfast — Coffee with milk and sugar, bread, prunes.

Dinner — Bread, clam chowder containing onions, potatoes and tomatoes.

Supper — Bread, milk, cornmeal with milk and sugar.

Saturday, June 18, 1910

Breakfast — Coffee with milk and sugar, bread, gingerbread.

Dinner — Bread, butter, frankfurters, potatoes, pickels.

Supper — Bread, milk, hominy with milk and sugar.

Sunday, June 19, 1910

Breakfast — Coffee with milk and sugar, bread, jelly.

Dinner — Bread, roast beef, gravy, potatoes, green peas.

Supper — Bread, milk, cookies.

Monday, June 20, 1910

Breakfast — Coffee with milk and sugar, bread, oatmeal with milk and sugar.

Dinner — Bread, pork and beans, lettuce, vinegar.

Supper — Bread, milk, pea soup.

Tuesday, June 21, 1910

Breakfast — Coffee with milk and sugar, bread, prunes.

Dinner — Bread, scrambled eggs, potatoes, bread pudding containing milk, sugar and cinnamon.

Supper — Bread, milk, hominy with milk and sugar.

Wednesday, June 22, 1910

Breakfast — Coffee with milk and sugar, bread, butter.

Dinner — Bread, roast beef, gravy, potatoes.

Supper — Bread, milk, oatmeal with milk and sugar.

MONTHLY REPORT

For month of . . . . 19 . .

Of . . . . No. . . . .

To Joseph P. Byers, *Superintendent House of Refuge, Randall's Island, N. Y.:*

By whom have you been employed the past month? . . . .

. . . .

(Address of employer)

At what kind of work? . . . . Wages per week? . . . .

How much of your earnings have you expended and for what?

Board, $. . . . . Clothing, $. . . . . Car fare, $. . . . .

Amusements, $. . . . . Other expenses, $. . . . .

How much money have you on hand or due you? Cash on hand, $. . . . . In savings bank, $. . . . . Due me, $. . . . .

If you have been idle during any portion of the month state why.

. . . .

Are you satisfied with your present employment; of not, why not?

. . . .

. . . .

Where and how do you usually spend your evenings? . . . .

. . . .

Are you living at home? . . . . If not, give name of person with whom you board? . . . .

Do you attend church? . . . . Where? . . . .

State what books, papers or magazines you have read . . . .

. . . .

. . . .

Have you attended any public meetings, dances, picnics, theatres or parties during the month? If so, where and when? . . . .

. . . .

Have you had any trouble or misunderstanding with anyone? If so, state full particulars...

....

Remarks:...

....

....

Name .... No. ....

City ....

Date ....

Statement of Parent, Guardian or Employer: I have read the above statements and certify that to the best of my knowledge they are true.

....

(Parent, guardian or employer)

Statement prepared by request in accordance with a resolution adopted at the thirty-third session of the National Conference of Charities and Correction, held in Philadelphia, May, 1906:

POPULATION

	Male.	Female. *	Total.
Number of inmates present at beginning of fiscal year	618	....	618
Number received during the year	344	....	344
Number discharged or died during the year	549	....	549
Number at end of the fiscal year	413	....	413
Daily average attendance (i. e. number of inmates actually present) during the year	....	....	505.22
Average number of officers and employees during the year	....	....	110.512

* No females are admitted.

EXPENDITURES

Current expenses:

1. Salaries and wages	$73,071 98
2. Clothing	11,567 38
3. Subsistence	35,620 39
4. Ordinary repairs	115 60
5. Office, domestic and outdoor expenses	24,668 92
Total	$145,044 27

Extraordinary expenses:

1. New buildings, land, etc.	....
2. Permanent improvements to existing buildings.	$9,685 80
Total	$9.685 80

MANAGERS

List of Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York from 1824 to 1910

Elected.		Retired.
1824	Cadwallader D. Colden	1832
1824	Stephen Allen	1852
1824	Peter A. Jay	1827
1824	John T. Irving	1829
1824	John Griscom	1833
1824	Henry J. Wyckoff	1839
1824	Cornelius Du Bois	1846
1824	Ralph Olmstead	1835
1824	Robert F. Mott	1826
1824	Arthur Burtis	1829
1824	Isaac Collins	1829
1824	Samuel Cowdrey	1829
1824	Gilbert Coutant	1826
1824	John Duer	1826
1824	Cornelius R. Duffie	1826
1824	Thomas Eddy	1829
1824	James W. Gerard	1829
1824	Joseph Grinnell	1830
1824	John E. Hyde	1831
1824	Ansel W. Ives, M. D	1831
1824	James Lovett	1850
1824	Hugh Maxwell	1848
1824	Henry Mead	1826
1824	John Stearns, M. D	1835
1824	John Targee	1826
1824	J. M. Wainright, D. D	1827
1825	Robert C. Cornell	1844
1826	William A. Davis	1827
1826	Thomas Gibbons	1827
1826	William F. Mott	1839
1826	Richard Riker	1827
1826	Frederick Sheldon	1834
1826	Peter Sharpe	1842
1826	Arthur Tappan	1827
1826	Gabriel Wisner	1827
1826	Samuel Wood	1831
1827	Isaac S. Hone	1830
1827	Herman Averill	1834
1827	Joseph Curtis	1829
1827	William W. Fox	1853
1827	James Kent, LL. D	1828
1827	Benjamin L. Swan	1830
1827	David Stebbins	1829
1827	M. Van Schaick	1834
1828	John Hunter	1835
1829	Jacob Harvey	1842
1829	Rufus L. Ford	1852
1829	Dennis McCarthy	1835
1829	Nathaniel Richards	1834
1829	Najah Taylor	1830
1829	John Wyman	1836
1830	Russel H. Nevins	1836
1830	James J. Roosevelt, Jr	1861
1830	Frederic A. Tracey	1837
1830	Robert D. Weekes	1854
1830	William L. Stone	1844
1831	Jacob Drake	1845
1831	William Kent	1834
1831	Peter R. Starr	1837
1831	Charles Town	1832
1832	Silas Brown	1847
1832	Brittain L. Woolley	1849
1833	Samuel Stevens	1844
1834	Benjamin S. Collins	1844
1834	Eli Goodwin	1837
1834	John R. Townsend	1846
1834	John R. Willis	1844
1835	Augustin Averill	1853
1835	Ira B. Underhill	1840
1836	Cornelius W. Lawrence	1842
1836	Anthony Lamb	1850
1836	William Mandeville	1843
1836	Oliver M. Lownds	1839
1837	Robert J. Murray	1841
1837	Chandler Starr	1840
1838	David C. Colden	1850
1838	Oliver Hewlett	1839
1838	Rev. C. Hance	1839
1839	Mahlon Day	1840
1839	Robert Kelly	1856
1839	Shepherd Knapp	1871
1840	Leonard Corning	1841
1840	Thomas Eddy, Jr	1842
1840	Harvey P. Peet	1850
1840	Marinus Willet	1841
1841	G. P. Disosway	1844
1841	Samuel Downer, Jr	1846
1841	Israel Russell	1858
1842	John H. Gourlie	1854
1842	Charles M. Leupp	1859
1842	James Marsh	1856
1843	William Moore	1844
1843	John T. Adams	1847
1844	John A. Weekes	1901
1844	Joshua S. Underhill	1857
1844	Cornelius Du Bois, Jr	1854
1845	Mahlon Day	1854
1845	James N. Cobb	1870
1845	P. A. Schermerhorn	1845
1845	Walter Underhill	1866

Elected.		Retired.
1845	James Van Nostrand	1847
1845	Elias G. Drake	1856
1845	George J. Cornell	1857
1846	John W. Edmonds	1854
1847	T. T. Luquere	1849
1847	Richard L. Schieffelin	1849
1847	James W. Underhill	1866
1847	C. E. Pierson, M. D	1855
1847	Linus W. Stevens	1864
1847	Smith W. Anderson	1849
1848	Daniel Seymour	1850
1849	James W. Beekman	1855
1849	Richard H. Ogden	1853
1849	John W. C. Leveridge	1896
1850	Benjamin B. Atterbury	1900
1850	Thomas W. Gale	1851
1850	Edgar S. Van Winkle	1882
1850	George F. Hussey	1858
1850	M. L. Seymour	1852
1851	Odgen Haggarty	1852
1851	Frederick W. Downer	1903
1852	Samuel L. Mitchell	1854
1852	Wm. H. Maxwell, M. D	1857
1852	Edmund M. Young	1865
1853	John J. Townsend	1889
1853	Andrew Warner	1891
1853	David Sands	1859
1853	John Bigelow	1855
1854	Robert Lenox Kennedy	1857
1854	Richard M. Hoe	1885
1854	Charles C. Leigh	1865
1855	Thomas B. Stillman	1865
1855	William C. Russell	1864
1855	Oliver S. Strong	1874
1856	William M. Prichard	1897
1856	James P. Cronkhite	1860
1856	James M. Halstead	1888
1856	Edgar Ketchum	1882
1857	Peter McMartin	1873
1857	Mark Spencer	1859
1857	Henry A. Cram	1894
1858	D. Jackson Steward	1891
1858	Francis P. Shoals	1862
1858	William Gale	1862
1859	Henry H. Barrow	1862
1859	Henry M. Alexander	1880
1859	William Cromwell	1872
1859	Joel Rathbone, Albany	1864
1860	Cyrus P. Smith, Brooklyn	1877
1862	Henry K. Bogart	1873
1863	Morris Franklin	1885
1864	Howard Potter	1866
1864	Henry Q. Hawley	1887
1865	D. Thomas Vail, Troy	1881
1865	Samuel W. Torrey	1860
1866	George W. Clinton, Buffalo	1879
1866	Benjamin D. Silliman, Brooklyn	1885
1866	Nicholas D. Herder	1877
1866	John A. Steward	1874
1869	Nathaniel Jarvis, Jr	1901
1869	Henry G. De Forest	1874
1871	Charles P. Daly	1885

Elected.		Retired.
1871	E. Randolph Robinson	1880
1872	Egerton L. Winthrop	1874
1872	Henry Dudley	1900
1874	Augustus R. McDonough	1885
1874	John J. McCook	1877
1874	James Davis	1876
1875	Elijah H. Kimball	1883
1875	Robert Kelly	1888
1875	Thomas Sullivan	1886
1876	Alex. McL. Agnew	1886
1877	Richard L. Larremore	1890
1878	J. S. T. Stranahan, Brooklyn	1898
1878	Henderson Moore	1889
1880	Theodore H. Mead	1881
1880	Alfred Wagstaff	1885
1881	Henry DeForrest Weekes	1887
1881	William L. Andrews	1892
1881	James H. Fay	
1883	Herbert R. Bishop	1884
1883	James Forsyth, Troy	1886
1884	Peter B. Olney	1888
1884	Frederick Kuhne	1890
1885	Horace W. Robbins	1904
1885	Benjamin C. Wetmore	1893
1885	John Sergeant Cram	1889
1885	Henry Alker	1886
1885	William A. Duer	1895
1885	Francis C. Moore	1893
1886	J. Coleman Drayton	1890
1886	Octavius A. White, M. D	1889
1886	Jacob F. Miller	1907
1887	Robert L. Banks	1893
1887	Edward M. Townsend	1904
1887	Alexander E. Orr, Brooklyn	1910
1888	Edgar Auchincloss	1890
1888	Stuyvesant F. Morris, M. D	
1889	Alfred J. Taylor	1893
1889	Francis C. Underhill	1891
1889	Sigourney W. Fay	1894
1889	William Watts Sherman	1902
1889	Henry A. C. Taylor	1899
1890	Evert Jansen Wendell	
1890	John J. Townsend	
1891	Walter C. Tuckerman	1894
1892	James J. Higginson	1902
1893	John S. Barnes	1907
1893	Frederic Bronson	1900
1893	William Bradford	1902
1893	Clement March	1904
1894	George G. Wheelock, M. D	1904
1894	Bronson Winthrop	1910
1894	Abraham Lansing	1895
1895	Richard H. Ewart	1895
1895	Thomas H. Barber	1905
1895	Stephen H. Olin	1900
1895	Wm. Gaston Hamilton	1904
1895	Louis Stuyvesant Chanler	1898
1895	Ogden Mills	1901
1895	Isaac Townsend	
1896	Frank S. Witherbee	1909
1898	Truman J. Backus	1904
1898	J. Hampden Robb	

Elected.		Retired.
1899	James A. Burden, Jr	1904
1899	Louis DeForrest Downer	1903
1900	R. Somers Hayes	1904
1900	Chester Griswold	1902
1901	E. W. BLOOMINGDALE	
1901	JOHN D. CRIMMINS	
1901	Robert P. Perkins	1907
1902	Thomas F. Wentworth	1907
1902	Richard N. Young	1908
1902	HERBERT PARSONS	
1903	NEWBOLD MORRIS	
1904	GEORGE W. FOLSOM	
1905	RICHARD M. HOE	
1905	B. Talbot B. Hyde	1910
1907	WM. B. OSGOOD FIELD	
1907	JOHN T. SILL	
1908	PHILLIPS B. THOMPSON	
1908	WINTHROP BURR	
1910	J. SANFORD BARNES, JR	
1910	WILLIAM I. WALTER	

PRESIDENTS.

1824	Cadwallader D. Colden	1832
1832	Stephen Allen	1852
1852	Robert Kelly	1856
1856	Oliver S. Strong	1874
1874	Edgar Ketcham	1881
1881	John A. Weekes	1891
1891	Alexander E. Orr	1907
1907	J. HAMPDEN ROBB	

TREASURERS.

1824	Ralph Olmstead	1828
1828	Cornelius DuBois	1846
1846	Israel Russel	1848
1848	Joshua S. Underhill	1857
1857	Walter Underhill	1866
1866	John A. Stewart	1874
1874	Nathaniel Jarvis, Jr	1886
1886	Henry Dudley	1892
1892	Walter C. Tuckerman	1893
1893	Frederic Bronson	1895
1895	Edward M. Townsend	1904
1904	F. S. Witherbee	1904
1904	Robert P. Perkins	1907
1907	John D. Crimmins	1908
1909	WINTHROP BURR	

SECRETARIES.

1824	Robert F. Mott	1826
1826	Samuel Cowdrey	1827
1827	Isaac S. Hone	1828
1828	Frederick Sheldon	1833
1833	Ralph Olmstead	1835
1835	John R. Townsend	1843
1843	John H. Gourlie	1853
1853	James W. Underhill	1854
1854	Andrew Warner	1880
1880	Frederick W. Downer	1886
1886	Nathaniel Jarvis, Jr	1889
1889	James H. Fay	1890
1890	Evert Jansen Wendell	1893
1893	William Bradford	1895
1895	Nathaniel Jarvis, Jr	1900
1900	EVERT JANSEN WENDELL	

CORRESPONDING SECRETARIES.

1884	James H. Fay	1886
1886	Frederick W. Downer	1892
1892	JOHN J. TOWNSEND	

SUPERINTENDENTS.

1824	Joseph Curtis	1826
1826	Nathaniel C. Hart	1838
1838	David Terry, Jr	1844
1844	Samuel S. Wood	1849
1849	John W. Ketchum	1863
1863	Israel C. Jones	1892
1892	O. W. Lowry	1894
1894	C. W. Jungen	1894
1894	V. M. Masten	1895
1895	A. C. Collson (Ac't)	1896
1896	Elisha M. Carpenter	1899
1899	Omar V. Sage	1904
1904	Bezaleel H. Gallup (Ac't)	1905
1905	Joseph P. Byers	1910
1910	EDWARD C. BARBER (Ac't)	

PHYSICIANS.

1825	John Stearns, M. D	1831
1825	Ansel W. Ives, M. D	1832
1832	H. A. Field, M. D	1835
1832	Galen Carter, M. D	1854
1836	Jno. C. Cheeseman, M. D	1838
1836	James B. Nelson, M. D	1838
1854	H. N. Whittlessy, M. D	1866
1866	J. Colby, M. D	1873
1879	George A. Spalding, M. D	1899
1893	R. Van Stanford, M. D	1897
1897	W. G. EYNON, M. D	

OCULISTS.

Elected.		Retired.
1894	C. Cole Bradley, M. D	1897
1897	W. W. Gilfillan, M. D	

DENTISTS.

Elected.		Retired.
1893	John H. Higgins, D. D. S	1894
1894	J. W. Moore, D. D. S	1895
1895	H. C. Griffith, D. D. S	1900
1900	A. Walter Hermann, D. D. S	

CHAPLAINS.

Elected.		Retired.
1825	Rev. John Stamford, D. D	1826
1835	Rev. Thomas S. Barrett, M. D	1854
1854	Rev. Franklin S. Howe	1855
1855	Rev. Richard Horton	1863
1863	Rev. B. K. Pierce, D. D	1872
1872	Rev. G. H. Smythe	1882
1882	Rev. Wm. C. Steele, D. D	1894

FORM OF BEQUEST.

I give and bequeath to "the Managers of the Society for the Reformation of Juvenile Delinquents in the City of New York," a corporation created by the laws of the State of New York, the sum of .... Dollars, and the receipt of the Treasurer of said corporation shall be a sufficient discharge to my executors for the same.

SEVENTY-FIFTH ANNUAL REPORT

OF THE

MANAGERS

OF THE

New York Institution for the Blind

For the Year Ending September 30, 1910

LUX ORITUR:

"And I will bring the blind by a way that they knew not; I will lead them in paths that they have not known; I will make darkness light before them."—*Isaiah, XLII, 16.*

TRANSMITTED TO THE LEGISLATURE JANUARY 20, 1911

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

MANAGERS OF THE NEW YORK INSTITUTION FOR THE BLIND IN CHRONOLOGICAL ORDER.

From the Time of its Incorporation, 1831, with their Terms of Service.

Ackerly, Samuel, M.D.	1831–1845
Averill, Herman	1831–1832
Bolton, Curtis	1831–1835
Donaldson, James	1831–1832
Bogart, Henry K.	1831–1832
Ramsen, Henry	1831–1832
Stuyvesant, John R.	1831–1840
Price, Thompson	1831–1840
Ketchum, Morris	1831–1837
Miller, Sylvanus	1831–1832
Crosby, William B.	1831–1833
Lee, Gideon	1831–1836
Ketchum, Hiram	1831–1838
Wood, Samuel	1831–1836
Jenkins, Thomas W.	1831–1836
Thomas, Henry	1831–1834
Nevins, Rufus L.	1831–1832
Beers, Joseph D.	1831–1832
Mott, Samuel F.	1831
Patterson, Matthew C.	1831–1833
Russ, John D., M.D.	1833–1834
Dwight, Theodore	1833–1837
Brown, Silas	1833–1859
Hagg, John P.	1833
Spring, George	1833–1835
Walker, John W.	1833–1839
Miller, Franklin	1833–1835
Steel, Jonathan D.	1833
Allen, Moses	1834
Lyons, Stephen	1834–1836
Dissosway, Gabriel P.	1834–1836
Phelps, Anson G.	1834–1855
Crosby, William H.	1835
Hoyt, Charles	1835–1839
Oakley, Charles	1835
Allen, George F.	1836–1839
Titus, Peter S.	1836
Allen, George F.	1836–1839 1841–1862
Trulock, Joseph	1836–1840
Mandeville, William	1836–1837
Chandler, Adoniram	1836
Cushman, D. Alonzo	1837–1843
Blakeman, Wm. N., M.D.	1837–1839 1841
Wood, Isaac, M.D.	1837–1859
Hart, Joseph C.	1837–1840
Holmes, Curtis	1837–1838
Roome, Edward	1837–1845
Seton, Samuel W.	1837
Gracie, Robert	1838–1861
Demilt, Samuel	1838
Hart, James H.	1839
Murray, Robert J.	1839–1858
Schermerhorn, Peter Augustus,	1839–1845
Tallmadge, Henry F.	1839–1841
Thompson, Martin E.	1839
Moore, Clement C.	1840–1850
Olyphant, D. W. C.	1840
Averill, Augustine	1840
Beers, Cyrenius	1841–1853
Suydam, Lambert	1841–1842
Holmes, Silas	1841–1842
Case, Robert L.	1841–1861
Crosby, John P.	1841–1859
Collins, Stacey B.	1841
Schermerhorn, E. H.	1841–1842
Marsh, James	1842–1852
Murray, Hamilton	1842–1847
Walsh, A. R.	1842–1850
Wood, John	1842–1850
Jones, Edward	1843–1850
Whittemore, William T.	1843–1845
Smith, Floyd	1844–1848
Dean, Nicholas	1844–1848
Jones, William P.	1846–1849
Thurston, William R.	1846–1851
Sheldon, Henry	1846–1854
King, John A.	1848–1854
Schell, Augustus	1849–1883
Day, Mahlon	1849–1854
Adams, George F.	1850–1859 1865
Adams, John G.	1851–1858
Ogden, Gouverneur M.	1851–1857
Cobb, James N.	1851–1858
Beadle, Edward L.	1851–1862
Wood, Edward	1852–1861
Ogden, John D., M.D.	1853–1855
Craven, Alfred W.	1854–1861
Olyphant, G. T.	1855–1857
Abbatt, William M.	1855–1857

Noyes, William Curtis	1855–1859
Dumont, William	1856–1862
Warren, James	1856–1859
Cammann, George P., M.D.	1858
Rutherford, Lewis M.	1858–1861
Van Rensselaer, Henry	1858–1860
Hone, Robert S.	1859–1891
Tomes, Francis	1859–1860
Norton, Charles B.	1859–1861
Church, William H., M.D.	1859–1864
Hutchins, Waldo	1860–1867
Tuckerman, Charles K.	1860–1867
Kennedy, James Lenox	1860–1864
Travers, William R.	1860
Tompkins, Daniel H.	1860–1874
Aspinwall, J. Lloyd	1860–1861
Suydam, D. Ludig	1861–1884
Daly, Charles P.	1861
Hosack, Nathaniel P.	1862–1876
Grafton, Joseph	1862–1872
Myers, T. Bailey	1862–1887
Edgar, Newbold	1862–1864 1868
Donnelly, Edward C.	1862–1864
Lord, James Cooper	1862–1864
Schermerhorn, Alfred	1862–1865 1867–1868
Irving, John Treat	1863–1896
Brown, John Crosby	1862–1864
Van Rensselaer, Alex	1862–1865 1867–1877
Potter, Clarkson N.	1863–1866
McLeod, James M.	1863–1890
Clift, Smith	1865–1893
Hoffman, Charles B.	1865–1868
Emmet, Thos. Addis, M.D.	1865–1866
Whitewright, William	1866–1898
Schermerhorn, Wm. C.	1866–1901
De Rahm, Charles	1866–1890
Hilton, Henry	1866
Murrill, John E.	1866–1867
Stout, Francis A.	1867–1892
Butterfield, Daniel	1868
Hoffman, William B.	1868–1879
Gerard, James W.	1869–1873
Schermerhorn, F. Augustus	1870–1910
Marié, Peter	1870–1903
Rhoades, J. Harsen	1869–1872
Rhinelander, Frederick W.	1874–1904
Sheldon, Frederick	1874–1906
Robbins, Chandler	1875–1904
Strong, Charles E.	1875–1887
Schuyler, Philip	1878–1898
Prime, Temple	1878–1887
Kane, John I.	1881–1910
King, Edward	1884–1893
Schell, Edward	1885–1893
Bronson, Frederick	1888–1900
Kingsland, Ambrose C.	1889–1890
Robbins, George A.	1889–1895
Kissel, Gustav E.	1891–1910
Bowers, John M.	1891–1906
Peabody, George L., M.D.	1891–1910
Marshall, Charles H.	1892–1910
Smith, Gouverneur, M.D.	1893–1898
Davis, Howland	1894–1910
Duer, William A.	1894–1905
Hamilton, William G.	1894–1905
Appleton, William W.	1896–1910
Tappen, Frederick D.	1897–1901
Armstrong, D. Maitland	1898–1910
Wheelock, George G., M.D.	1898–1907
Fairchild, Charles S.	1898–1906
Soley, James Russell	1900–1910
Winthrop, Egerton L., Jr.	1901–1910
Wickersham, George W.	1902–1909
Foster, Frederick De Peyster.	1903–1910
Rhinelander, Thomas N.	1905–1910
McIlvaine, Thompkins	1905–1910
Godkin, Lawrence	1905–1909
Derby, Richard H., M.D.	1906–1907
Borland, J. Nelson	1907–1910
Montant, August P.	1907–1909
Rhoades, J. Harsen, 2d.	1907–1910
Tucker, Samuel Auchmuty	1907–1910
Hone, Robert G.	1908–1910
Knapp, Arnold, M.D.	1909–1910
Blagden, Linzee	1910
DeGersdorff, Carl A.	1910

MANAGERS OF THE NEW YORK INSTITUTION FOR THE BLIND IN ALPHABETICAL ORDER.

From the Time of its Incorporation, 1831, with their Terms of Service.

Abbatt, William M.	1855–1857
Ackerly, Samuel, M.D.	1831–1845
Adams, John G., M.D.	1851–1858
Allen, George F.	1836–1839 1841–1862
Allen, Moses	1834
Appleton, William W.	1896–1910
Armstrong, D. Maitland	1898–1910
Aspinwall, J. Lloyd	1860–1861
Averill, Augustine	1840
Averill, Herman	1831–1832
Beadle, Edward L.	1851–1862
Beers, Cyrenius	1841–1853
Beers, Joseph D.	1831–1832
Blagden, Linzee	1910
Blakeman, Wm. N., M.D.	1837–1839 1841
Bogert, Henry K.	1831–1832
Bolton, Curtis	1831–1835
Borland, J. Nelson	1907–1910
Bowers, John M.	1891–1906
Bronson, Frederick	1888–1900
Brown, John Crosby	1862–1864
Brown, Silas	1833–1859
Burrill, John E.	1866–1867
Butterfield, Daniel	1868
Cammann, George P., M.D.	1858
Case, Robert L.	1841–1861
Chandler, Adoniram	1836
Church, William H., M.D.	1859–1864
Clift, Smith	1865–1893
Cobb, James N.	1851–1858
Collins, Stacey B.	1841
Craven, Alfred W.	1854–1861
Crosby, John P.	1841–1859
Crosby, William B.	1831–1833
Crosby, William H.	1835
Cushman, D. Alonzo	1837–1843
Daly, Charles P.	1861
Davis, Howland	1894–1910
Day, Mahlon	1849–1854
Dean, Nicholas	1844–1848
DeGersdorff, Carl A.	1910
Demilt, Samuel	1838
De Rahm, Charles	1866–1890
Derby, Richard H., M.D.	1906–1907
Dissosway, Gabriel P.	1834–1836
Donaldson, James	1831–1832
Donnelly, Edward C.	1862–1864
Duer, William A.	1894–1905
Dumont, William	1856–1862
Dwight, Theodore	1833–1837
Edgar, Newbold	1862–1864 1868
Emmet, Thos. Addis, M.D.	1865–1866
Fairchild, Charles S.	1898–1906
Foster, Frederick De Peyster,	1903–1910
Gerard, James W.	1869–1873
Godkin, Lawrence	1905–1909
Gracie, Robert	1838–1861
Grafton, Joseph	1862–1872
Hagg, John P.	1833
Hamilton, William G.	1894–1905
Hart, James H.	1839
Hart, Joseph C.	1837–1840
Hilton, Henry	1866
Hoffman, Charles B.	1865–1868
Hoffman, William B.	1868–1879
Holmes, Curtis	1837–1838
Holmes, Silas	1841–1842
Hone, Robert G.	1908–1910
Hone, Robert S.	1859–1891
Hosack, Nathaniel P.	1862–1876
Hoyt, Charles	1835–1839
Hutchins, Waldo	1860–1867
Irving, John Treat	1863–1896
Jenkins, Thomas W.	1831–1836
Jones, Edward	1843–1850
Jones, George F.	1850–1859 1865
Jones, William P.	1846–1849
Kane, John I.	1881–1910
Kennedy, James Lenox	1860–1864
Ketchum, Hiram	1831–1838
Ketchum, Morris	1831–1837
King, Edward	1884–1893
King, John A.	1848–1854
Kingsland, Ambrose C.	1889–1890
Kissel, Gustav E.	1891–1910
Knapp, Arnold, M.D.	1909–1910
Lee, Gideon	1831–1836
Lord, James Cooper	1862–1864
Lyons, Stephen	1834–1836

Mandeville, William	1836–1837
Marié, Peter	1870–1903
Marsh, James	1842–1852
Marshall, Charles H.	1892–1910
McIlvaine, Tompkins	1905–1910
McLean, James M.	1863–1890
Miller, Franklin	1833–1835
Miller, Sylvanus	1831–1832
Montant, August P.	1907–1909
Moore, Clement C.	1840–1850
Mott, Samuel F.	1831
Murray, Hamilton	1842–1847
Murray, Robert J.	1839–1858
Myers, T. Bailey	1862–1887
Nevins, Rufus L.	1831–1832
Norton, Charles B.	1859–1861
Noyes, William Curtis	1855–1859
Oakley, Charles	1835
Ogden, Gouverneur M.	1851–1857
Ogden, John D., M.D.	1853–1855
Olyphant, D. W. C.	1840
Olyphant, G. T.	1855–1857
Patterson, Matthew C.	1831–1833
Peabody, George L., M.D.	1891–1910
Phelps, Anson G.	1834–1855
Potter, Clarkson N.	1863–1866
Price, Thompson	1831–1840
Prime, Temple	1878–1887
Remsen, Henry	1831–1832
Rhinelander, Frederick W.	1874–1904
Rhinelander, Thomas N.	1905–1910
Rhoades, J. Harsen	1869–1872
Rhoades, J. Harsen, 2d.	1907–1910
Robbins, Chandler	1875–1904
Robbins, George A.	1889–1895
Roome, Edward	1837–1845
Russ, John D., M.D.	1833–1834
Rutherford, Lewis M.	1858–1861
Schell, Augustus	1849–1883
Schell, Edward	1885–1893
Schermerhorn, Alfred	1862–1865 1867–1868
Schermerhorn, E. H.	1841–1842
Schermerhorn, F. Augustus	1870–1910
Schermerhorn, Peter Augustus,	1839–1845
Schermerhorn, Wm. V. C.	1866–1902
Schuyler, Philip	1878–1898
Seton, Samuel W.	1837
Sheldon, Frederick	1874–1906
Sheldon, Henry	1846–1854
Smith, Floyd	1844–1848
Smith, Gouverneur M., M.D.	1893–1898
Soley, James Russell	1900–1910
Spring, George	1833–1835
Steel, Jonathan D.	1833
Stout, Francis A.	1867–1892
Strong, Charles E.	1875–1887
Stuyvesant, John R.	1831–1840
Suydam, D. Lydig	1861–1884
Suydam, Lambert	1841–1842
Tallmadge, Henry F.	1839–1841
Tappen, Frederick D.	1897–1901
Thomas, Henry	1831–1834
Thompson, Martin E.	1839
Thurston, William R.	1846–1851
Titus, Peter S.	1836
Tomes, Francis	1859–1860
Tompkins, Daniel H.	1860–1874
Travers, William R.	1860
Trulock, Joseph	1836–1840
Tucker, Samuel Auchmuty	1907–1910
Tuckerman, Charles K.	1860–1867
Van Rensselaer, Alex.	1862–1865 1867–1877
Van Rensselaer, Henry	1858–1860
Walker, John W.	1833–1839
Walsh, A. R.	1842–1850
Warren, James	1856–1859
Wheelock, George G., M.D.	1898–1907
Whitewright, William	1866–1898
Whittemore, William T.	1843–1845
Wickersham, George W.	1902–1909
Winthrop, Egerton L., Jr.	1901–1910
Wood, Edward	1852–1861
Wood, Isaac, M.D.	1837–1859
Wood, John	1842–1850
Wood, Samuel	1831–1836

OFFICERS OF THE INSTITUTION.

From its Incorporation in 1831, with their Terms of Service.

PRESIDENTS.

Ackerly, Samuel, M. D.	1831–1842
Phelps, Anson G.	1845–1853
Wood, Isaac, M. D.	1854–1859
Allen, George F.	1860–1862
Schell, Augustus	1863–1883
Hone, Robert S.	1884–1887
McLean, James M.	1888–1890
Irving, John Treat	1891–1895
Schermerhorn, Wm. C.	1896–1901
Schermerhorn, F. Augustus	1901–1909
Davis, Howland	1909–1910

VICE-PRESIDENTS.

Averill, Herman	1831–1832
Brown, Silas	1833–1835
Titus, Peter S.	1836
Phelps, Anson G.	1837–1842
Wood, Isaac, M. D.	1843–1853
Gracie, Robert	1855–1860
Beadle, Edward L.	1861–1862
Hone, Robert S.	1863–1883
Suydam, D. Lydig	1884
McLean, James M.	1885–1887
Clift, Smith	1888–1893
Schermerhorn, Wm. C.	1894–1895
Marie, Peter	1896–1903
Rhinelander, F. W.	1903–1904
Sheldon, Frederick	1905–1906
Peabody, George L., M. D.	1907–1910

TREASURERS.

Bolton, Curtis	1831–1835
Brown, Silas	1836–1859
Wood, Edward	1860–1861
Schell, Augustus	1862
Kennedy, James Lenox	1863–1864
Clift, Smith	1865
Grafton, Joseph	1866–1871
Whitewright, Wm.	1872–1896
Davis, Howland	1897–1909
Foster, Fred De P.	1909–1910

RECORDING SECRETARIES.

Bogart, Henry K.	1831–1832
Russ, John D., M. D.	1833–1834
Crosby, William H.	1835
Allen, George F.	1836–1839 1841–1859
Hone, Robert S.	1860–1862
Brown, John Crosby	1863
Myers, T. Bailey	1864–1883
Schermerhorn, F. Augustus	1884–1901
Marshall, Charles H.	1901–1910

CORRESPONDING SECRETARIES.

Donaldson, James	1831–1832
Dwight, Theodore	1833–1837
Wood, Isaac, M. D.	1839–1842
Roome, Edward	1843–1844
Schermerhorn, Peter Augustus	1845
Jones, Edward	1846–1850
Wood, Isaac, M. D.	1851–1853
Crosby, John P.	1854–1859
Church, William H., M. D.	1860
Tuckerman, Charles K.	1861–1867
Schermerhorn, Wm. C.	1868–1893
Bronson, Frederick	1894–1895
Sheldon, Frederick	1896–1905
Peabody, George L., M. D.	1905–1906
Appleton, William W.	1907–1910

PRINCIPALS OF THE INSTITUTION.

From its Incorporation in 1831, with their Terms of Service.

Russ, John D., M. D.... ..1832–1834
Office unfilled..1835 and part of 1836
Jones, Silas 1836–1840
Vroom, Peter D., M. D...1841–1842
Boggs, William 1843–1845
Chamberlain, James F.....1846–1852
Cooper, T. Golden 1853–1860
Rankin, Robert G.........1861–1863
Wait, William P., 1863 to March 1, 1905. Emeritus Principal from March 1, 1905.
Tewkesbury, Everett B., from March 1, 1905.

BOARD OF MANAGERS.

1910.

	Terms of continuous service
F. AUGUSTUS SCHERMERHORN	Since 1870
JOHN I. KANE	“ 1881
GUSTAV E. KISSEL	“ 1891
GEORGE L. PEABODY, M. D................	“ 1891
CHARLES H. MARSHALL	“ 1892
HOWLAND DAVIS	“ 1894
WILLIAM W. APPLETON	“ 1896
D. MAITLAND ARMSTRONG	“ 1898
JAMES RUSSELL SOLEY..................	“ 1901
EGERTON L. WINTHROP, Jr..............	“ 1901
FREDERICK DE PEYSTER FOSTER........	“ 1902
THOMAS N. RHINELANDER	“ 1905
TOMPKINS McILVAINE	“ 1905
J. NELSON BORLAND	“ 1907
J. HARSEN RHOADES	“ 1907
*AUGUST P. MONTANT	“ 1907
SAMUEL AUCHMUTY TUCKER............	“ 1907
ROBERT G. HONE	“ 1908
ARNOLD KNAPP, M. D...................	“ 1909
†LINZEE BLAGDEN......................	“ 1910
†CARL A. DE GERSDORFF................	“ 1910

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* Died Nov. 26, 1909. † Appointed Jan. 5, 1910.

OFFICERS OF THE BOARD.

HOWLAND DAVIS	President
GEORGE L. PEABODY, M. D.	Vice-President
CHARLES H. MARSHALL	Recording Secretary
WILLIAM W. APPLETON	Corresponding Secretary
FREDERICK DE PEYSTER FOSTER	Treasurer

STANDING COMMITTEES.

Committee on Finance.

Gustav E. Kissel, Thomas N. Rhinelander,
J. Harsen Rhoades.

Committee on Supplies, Repairs and Improvements.

John I. Kane, J. Nelson Berland,
Charles H. Marshall, Robert G. Hone,
Linzee Blagden.

Committee on Education.

William W. Appleton, F. Augs. Schermerhorn,
Tompkins McIlvaine, Samuel A. Tucker.

Committee on Manual Training.

D. Maitland Armstrong, Dr. Arnold Knapp,
Egerton L. Winthrop, Jr., Carl A. De Gersdorff.

The President shall be *ex officio* member of all standing committees.

The Vice-President and Treasurer shall be *ex officio* members of the Committee on Finance. (By-Laws)

FACULTY.

William B. Wait	Emeritus Principal
Everett B. Tewksbury	Principal

Literary Department.

Mary B. Schoonmaker,
Margaret A. McCann,
Dora M. Robinson,
Helen Hume,
Louisa A. McCann,
Pauline M. Weimer,
Harriet M. Glover,
Chester E. Taylor,
Karl S. Wells.

Music Department.

Hannah A. Babcock, Director.
Pauline Farrington,
Mary Bruce Allen,
*Susan B. Hawks,
†Gertrude L. Martin,
L. Josephine Boynton,
F. Henry Tschudi,
Robert W. Kellogg.

Tuning.

Robert J. Harvey.

Kindergarten.

Anna R. Smith.

Manual Training and Home Science.

Rudolph Musseil,
Daniel McClintock,
Mary B. Schoonmaker,
Frances A. Ward,
Deborah Kipp.

Physical Training.

Mary Florence Perham,
Jesse F. Williams

Dwight L. Hubbard, M. D.	Attending Physician
Ernestine Senior	Matron

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* To Oct. 31, 1910. † From Oct. 31, 1910.

STATE OF NEW YORK

No. 15.

IN ASSEMBLY,

JANUARY 20, 1911.

SEVENTY-FIFTH ANNUAL REPORT OF THE NEW YORK INSTITUTION FOR THE BLIND.

To the Honorable, the Legislature of the State of New York:

The Managers of the New York Institution for the Blind, in compliance with the provisions of the act of the Legislature, respectfully submit their report for the year ending September 30, 1910.

The following is a summarized statement of the money received and expended:

CURRENT ACCOUNT.

Balance September 30, 1909	$3,207 84
Current receipts	133,733 71
	$136,941 55
Current expenditures	$132,278 07
Cash balance September 30, 1910	4,663 48
	$136,941 55

INVESTMENT FUND ACCOUNT.

Receipts:

Balance September 30, 1909	$37,080 84
Interest	16,377 99
Legacies	5,000 00
Real estate	40,000 00
Building Fund	43,000 00
Library Fund	13,500 00
Principal Fund	56,000 00
	$210,958 83

Payments:

Taxes and assessments	$31,879 23
Transferred to current account for current expense	26,000 00
Real estate	120,292 30
Legal expense	2,399 17
Balance September 30, 1910	30,388 13
	$210,958 83

BUILDING FUND ACCOUNT.

Receipts:

Balance September 30, 1909	$37,232 17
Real estate	10,000 00
Interest	420 00
	$47,652 43

Payments:

Transferred to Investment Fund	$43,000 00
Transferred to current account, interest	2,500 00
Real estate	311 30
Legal expense	523 05
Balance September 30, 1910	1,318 08
	$47,652 43

LIBRARY FUND ACCOUNT.

Balance on deposit September 30, 1909		$39,366 91
Miller mortgages, $98,950, less mortgage paid, $3,300		95,650 00
		$135,016 91
Receipts:		
Interest received	$5,568 46	
Donations	70 00	
		5,638 46
		$140,655 37

Payments:

Investment Fund	$13,500 00
Legal expense	96 33
Music and instruction	3,927 67
Balance, cash September 30, 1910	27,481 37
Miller mortgages	95,650 00
	$140,655 37

PRINCIPAL FUND.

Receipts:

Balance September 30, 1909	$16,535 43
Real estate	40,350 00
Interest	510 81
	$57,396 24

Payments:

Investment Fund	$56,000 00
Balance September 30, 1910	1,396 24
	$57,396 24

The Treasurer's statement, which is annexed, gives a detailed account of the current receipts and expenditures. Attention is also called to the report of the Principal, which is annexed.

The following is a list of the legacies and donations which have been received by the institution since its organization in 1831 to September 30, 1910:

Miles R. Burke	$2,000 00
Jane Van Cortland	300 00
Isaac Bullarn	101 66
Elizabeth Bayley	100 00
John Jacob Astor	5,000 00
William Bean	500 00
Peter G. Stuyvesant	3,000 00
John Horsburgh	5,000 00
Elizabeth Demilt	5,000 00
Sarah Demilt	2,000 00
C. D. Betts	40 00
Sarah Penny	500 00
Sarah Bunce	500 00
Elizabeth Idley	196 00
Samuel S. Howland	1,000 00
William Howe	2,985 14
Margaret Fritz	100 00
James McBride	500 00
Charles E. Cornell	521 96
Charles E. Deming	50 00
Mrs. DeWitt Clinton	$200 00
W. Brown	465 00
Elizabeth Gelston	1,000 00
Robert J. Murray	500 00
Seth Grosvenor	10,000 00
Elijah Withington	100 00
Benjamin F. Butler	812 49
Frissell Fund	2,000 00
Simeon V. Sickles	6,561 87
Anson G. Phelps	5,675 68
Thomas Reilly	2,254 84
Elizabeth Van Tuyle	100 00
Thomas Eggleston	2,000 00
Sarah A. Riley	100 00
William E. Saunders	725 84
Thomas Eddy	1,027 50
Robert C. Goodhue	1,000 00
Jonathan C. Bartlett	190 00
Stephen V. Albro	428 57
John Penfold	470 00

Madam Jumel	$5,000 00
Mrs. Steers	34 66
Thomas Garner	1,410 00
Elizabeth Magee	534 00
Chauncey & Henry Rose	5,000 00
John J. Phelps	2,350 00
Rebecca Elting	100 00
Gerard Martins	500 00
Regina Horstein	250 00
John Alstyne	10,320 44
Elizabeth & Sarah Wooley	5,984 83
Benjamin Nathan	1,000 00
Thomas M. Taylor	6,151 94
Simeon Abrahams	5,052 70
James Peter Van Horn	20,000 00
Caleb Swan	500 00
Mrs. A. E. Schermerhorn	10,000 00
Henry H. Munsell	3,396 32
Thomas C. Chardevoyne	5,000 00
William Dennistoun	11,892 77
William B. Astor	5,000 00
Benjamin F. Wheelwright	1,000 00
George T. Hewlett, executor	500 00
J. L. (of Liverpool, England)	25 00
Ephraim Holbrook	39,458 16
Mrs. Emma B. Corning	5,000 00
Eliza Mott	1,475 54
Maria M. Hobby	2,509 82
Daniel Marley	1,749 30
Henry E. Robinson	6,000 00
Henry Schade	20 00
Caroline Goff	4,161 59
Catherine P. Johnston	530 00
Mrs. Emma Strecker	12,221 66
Eli Robbins	5,000 00
Margaret Burr	11,011 11
Mary Burr	10,611 11
Samuel Willetts	5,045 00
Roosevelt & Sons	45 00
Augustus Schell	5,000 00
James Kelly	5,000 00
George Merrill	40 00
William B. and Leonard S. Bolles	2,949 11
Edward B. Underhill	500 00
Harriet Gross	1,000 00
Mary Hopeton Drake	2,340 00
George Stockstader	$325 00
Mary Rogers	1,000 00
Polly Dean	500 00
John Delaplaine	302 99
Abby A. Coates Winsor	1,000 00
Harriet Flint	1,776 74
Maria C. Robbins	10,000 00
Cash (sundry donations)	133 18
Julia A. Delaplaine	38,842 25
Mary E. Brandish	89 40
Thomas W. Strong	1,893 00
Maria Moffett	14,112 21
Maria Moffett (other stocks	2,800 00
John Vanderbilt	25 00
William Clymer	2,000 00
Julia L. Peyton	1,000 00
Amos R. Eno	5,000 00
Clarissa L. Crane	1,000 00
Leopold Boscowitz	1,000 00
Emeline S. Nichols	5,000 00
Margaret Salsbury	100 00
Sarah B. Munsell	477 56
Edward L. Beadle	4,303 99
Cecelia J. Loux	2,000 00
Mrs. E. Douglas Smith	90 00
William C. Schermerhorn	10,000 00
Mary J. Walker	24,193 76
Sarah Schermerhorn estate	5,137 50
Mary J. Walker estate	1,222 32
F. Augs. Schermerhorn (for building fund)	10,000 00
Mrs. Theodore B. Myers	5,000 00
Peter Marie's estate	3,145 47
Eli Specht	2,816 17
Catherine Talman	4,996 60
Annie Stewart Miller	116,401 93
F. Augs. Schermerhorn (for pipe organ)	5,840 00
Amelia B. Lazeras	10,000 00
Ida M. Chapman	200 00
Cash (W. B. W.)	600 00
Edith Smith	50 00
Mrs. J. J. Astor	20 00
E. E. West	20 00
Mrs. Dr. Wheelock	10 00
Theodore P. Nichols	8,000 00
Emma A. Tillotson	5,000 00

These funds were represented on September 30, 1910, by mortgages and by cash on deposit in the investment and library accounts, and the income has been used to carry on the educational work for which this institution was established.

This fund will be increased by such legacies as may hereafter be received, and it is the purpose of the Managers to keep the fund intact as a permanent endowment.

The Managers gratefully acknowledge the receipt of a bequest of five thousand dollars ($5,000) from the estate of Emma A. Tillotson. This bequest has been added to the legacy fund, which comprises all the legacies received since the organization of the institution in 1831.

In their last report the Managers stated that owing to complications arising from street openings through the property that had been acquired as a future site, they were considering the relinquishment of that property in favor of a different location.

The Managers are gratified to state that the change has been effected in a most satisfactory manner during the last year, and that a permanent site for the institution is now assured with ample grounds, healthful and beautiful surroundings, and easy of access from any part of the city.

All of which is respectfully submitted.

THE NEW YORK INSTITUTION FOR THE BLIND,

Howland Davis,

President.

Charles H. Marshall,

Recording Secretary.

City and County of New York, *ss.:*

Howland Davis, of said city, being duly sworn, saith: That he is President of The New York Institution for the Blind, and that the above report signed by him is true to the best of his knowledge and belief.

HOWLAND DAVIS.

Sworn to before me this 13th day of
January, 1911.

Floyd Peck (R. O. 2026).

Notary Public, New York County (17).

REPORT OF THE TREASURER.

Frederick De P. Foster, Treasurer, in account with The New York Institution for the Blind, for the year ending September 30, 1910.

Cash Statement.

Receipts.

September 30, 1909, balance, current account		$3,207 84
September 30, 1909, balance, investment account		37,080 84
September 30, 1909, balance Library Fund		39,366 91
September 30, 1909, balance Building Fund		37,232 17
September 30, 1909, balance Principal Fund		16,535 43

Real Estate (Capital).

Cash from sale of DeWitt property	$50,000 00	
Cash from sale of block bounded by St. Nicholas Ave., Broadway, and 165th and 166th Sts.	40,000 00	
Legacy from Emma A. Tillotson	5,000 00	
Donations	70 00	
		95,070 00

Receipts from Current Income.

From State of New York	$39,794 91	
From State of New Jersey	6,590 31	
From city of New York — tuition and support	1,687 50	
From music and instruction	464 50	
From New York county	2,704 38	
From Kings county	1,570 31	
From Queens county	174 80	
From Suffolk county	39 76	
From interest on mortgages, and on deposits	5,017 16	
From interest on investment funds, mortgages and deposits	16,377 99	
From interest on deposits — Principal Fund	510 81	
From interest on deposits — Building Fund	420 26	
From rent of baseball grounds	8,500 00	
From interest on Library Fund, mortgages and deposits	5,568 46	
From interest on adjournment of Pettet contract	350 00	
		89,771 15
		$318,264 34

DISBURSEMENTS.

Real Estate (Capital).

Interest on DeWitt mortgage (Bronxville)	$2,500 00	
Legal expenses incident to purchase of this property and sale of Bronxville property	2,918 55	
Paid for Yonkers property	115,000 00	
Paid on improvement of Yonkers property	5,795 03	
Assessments, Mt. Hope property	29,442 69	
		$155,656 27

Out of Income as to Real Estate.

Taxes, Mt. Hope	$2,600 96	
Labor, Mt. Hope	114 27	
Water rent, Mt. Hope	14 00	
Appraisals, Mt. Hope	100 00	
		2,820 23

Out of Income — Current Operating Expenses.

Supplies	$16,974 93	
Salaries and wages	41,940 25	
Clothing, dry goods, etc	2,876 29	
Furniture and fixtures	6,262 70	
Repairs	9,508 48	
Traveling expenses	150 38	
Electricity	563 37	
Gas	1,385 92	
Music and instruction	550 68	
Manual training	1,841 46	
Petty account	3,315 05	
Drugs and medicines	148 84	
Fuel	5,085 52	
Encyclopædia	95 00	
Principal's fund	3,832 67	
		94,531 54

Balance September 30, 1910.

Current Fund	$4,663 48	
Building Fund	1,318 08	
Principal Fund	1,396 24	
Investment Fund	30,388 13	
Library Fund	27,481 37	
		65,247 30
		$318,264 34

(Signed) FREDERICK DE P. FOSTER, *Treasurer.*

The foregoing account has been compared with the vouchers and accounts and is certified to be correct by Townsend, Dix & Yale, accountants and auditors.

(Signed) THOMAS N. RHINELANDER,
JOHN HARSEN RHOADES,
Finance Committee.

REPORT OF THE PRINCIPAL.

To the Board of Managers:

Gentlemen.— I beg to submit the following report for the year ending September 30, 1910:

Number of pupils September 30, 1909	168
Admitted during the year	28
Whole number instructed	196
Reductions	40
Number remaining	156

At the Convention of Instructors of the Blind, held at Little Rock, Ark., last summer, an interesting paper was read by H. Randolph Latimer of the Maryland School for the Blind, on the topic, "Co-ordination of Studies under a Single Teacher versus the Departmental Method in Schools for the Blind."

The problem is one that so fundamentally affects the organization of the school system, all the light possible for individual schools to shed should be given. While all schools have in common many subjects of instruction and similar methods of teaching them, the conditions determining the organization and administration of the individual schools are so varied as to make it impossible for any particular, detailed system to suffice for all.

Mr. Latimer says at the conclusion of his paper: "Finally, it appears that, if the blind are to be given an education which will insure them the greatest possible participation in the activities and enjoyments of life, it will be best accomplished through a combination of the grade and departmental methods of instruction." Our curriculum is one of many possible combinations. It is my purpose to elucidate briefly the present stage in its evolution.

The accompanying schedule gives in skeleton form the general arrangements of subjects, the number of classes, when they are held and the length of periods. No claim is made that it is an ideal scheme, but for the conditions to which it was made to conform, it has gradually assumed the present shape and works well.

To make clear the whole situation from the foundation, it should be known that the curriculum of the school is based on the primary and secondary syllabi of the University of the State of New York. Each syllabus gives in detail a description of the work to be done in all subjects and the amount of time to be spent on each.

In addition to the subjects common to the curricula of most primary and secondary schools, the Regents give examinations in the following music subjects: Voice, Pianoforte, Organ, Violin, Ear Training and Dictation, Melody Writing, Harmony and Counterpoint, Musical Form and Analysis, History of Music, and Acoustics. Credit is given for instruction in instrumental music and practice, and work in domestic science vouched for by the principal of the school.

Examinations are held throughout the State, all simultaneously in each subject. Our school with the rest receives the examination papers from Albany. The examination rules set for the State schools are in every particular followed by our school without exception. The answer papers are corrected by our teachers, and all papers standing above the required percentage are forwarded to the Education Department at Albany, where the papers are rated by State examiners. Pass cards are issued by the Education Department after each examination session, stating in the case of each pupil the subjects in which he passed. When a pupil has passed all the seven preliminary subjects he receives the "preliminary certificate," which admits him to the high school. In the high school each subject passed gives a certain number of counts, varying from one to five. Each year's work will average eighteen counts, and seventy-two counts are required for the "academic diploma." There is more than one possible course, each course having a certain amount prescribed from the general groups of subjects and the rest elective. The diploma issued to the pupil designates the course taken.

The advantages to the school of being a member of the State University are many and invaluable. Standards set by an outside authority are impersonal and fixed. The work and the tests of it being the same for the seeing as for the blind, the seeing can have a correct judgment of the quality of the blind students' work without knowing anything about the special methods of training them, and the blind themselves know early in life and continually thereafter that they can do much of the intellectual work especially set for the seeing.

As may be seen from the accompanying schedule the first purpose is to have, as far as possible, all the grades of a preliminary subject come in one period. All the reading classes are in the first period in the morning for one-half hour, and all the spelling classes in the next period for the same length of time; all the preliminary English classes come the third period for forty minutes, and all but the highest arithmetic class come the fourth period for forty minutes. Under this arrangement it is obviously impossible to have departmental teachers of reading, spelling, arithmetic and language; but there is an equally obvious advantage in the possibility of placing a pupil in the grade of a subject for which he is prepared, regardless of his advancement in other subjects. A pupil entering school at the age of twelve, for instance, may have to start in the beginning class in reading while he can do the work of the third grade in arithmetic, the fourth in language and the fifth in spelling. The rapidity of his promotion from class to class depends on his industriousness and ability, and his slowness in one subject interferes in no way with his advancement in other subjects, and failure to pass certain preliminary subjects, as, for instance, arithmetic, often the last preliminary to be passed, does not prevent the pupil from taking such high school subjects as naturally follow the preliminary subjects he has passed.

Arithmetic and algebra require more time for the use of type and slates. As most pupils have already passed examinations in both reading and spelling by the time they reach the highest class in arithmetic, the first and second periods are put together into one long period of sixty minutes for that class and for algebra, and for the fourth year English, in which more time is desirable for reading and practice in writing.

In the third period, besides all the preliminary English, there also come the first and third year high school English classes. The fifth period is chiefly devoted to five classes in the theory of music, and the sixth to the two singing classes. One half-hour period a week is reserved for physiology and hygiene for all pupils. The first two periods in the afternoon are always reserved for the class in domestic science; all the classes in United States history come in one period. The third, fourth and fifth periods are reserved for tutoring of beginners at the piano by the teachers' pupils under the supervision of a teacher. The physical training classes of certain groups of the oldest boys and girls keep definite places in the day from year to year. The beginning kindergarten class comes in the afternoon and the second year class in the morning. The afternoon class has some beginning primary work in the morning and the rest of the time for play; the morning class, which lasts a longer time, has most of the afternoon for play. All the other classes of the primary department and high school, including manual training, physical training, music lessons and practice and study hours, are adjusted as best they may be.

Some of our teachers are departmental teachers, so-called; that is, some teachers have classes in only one of the following departments: Physical training, manual training, music or kindergarten. On the other hand no teacher is strictly a grade teacher, as no one teacher has all the classes of the first grade, for instance. Every teacher has classes of more than one grade, and the grades he has one year are not necessarily the same as the year before. This arrangement gives the pupil the benefits to be derived from the influence of several mature minds and diverse personalities, and it gives to the teacher an acquaintance with a larger number of pupils, increases the variety of his work, and the scope of his knowledge of the school work as a whole. Changing the grade in one or more subjects from year to year, or assigning an entirely new subject to a teacher, gives that teacher fresh interest, stimulates growth, and prevents the machine-like routine which takes the life out of some teachers' work.

In the high school where a special and prolonged training is necessary for the teacher's preparation, departmental teachers are everywhere a necessity. But even here we have a combination of departmental and grade work. There is one teacher for all the Latin, one for German and French, one for mathematics and sciences, two for English, one for domestic science, and one or more for history; but each teacher has at least one preliminary subject. To give to a teacher all high school subjects in which examinations are taken at the close of the year would burden him with the most difficult work. By the present scheme the work is more evenly distributed, there are more teachers in both the primary and secondary departments, and the teaching force is more homogeneous, as there is no absolute line separating the high school teacher from the primary.

Such is our curriculum in outline. It is a plan toward which schools for the seeing are tending, for the grade system has serious features, and an ideal departmental system would require a large number of classrooms, a large number of teachers to meet the requirements of pupils who would form as many groups as there were combinations of grades of subjects, according to the advancement of individuals in each.

During the past year our facilities for embossing brass plates in the New York Point System have been increased. For many years we have written music in this way, and we are now transcribing text-books in Latin, German and French, besides a variety of small things for classroom use, such as notes, test papers, exercises, etc.

The following is a list of the subjects in which examinations were taken during the year, with the number of pupils passing in each:

Reading, 12.
Writing, 9.
Spelling, 12.
Arithmetic, 8.
Geography, 5.
Elementary English, 9.
U. S. History & Civics, 5.
English, 1st year, 8.
English, 2nd year, 6.
English, 3rd year, 6.
English, 4th year, 3.
English Grammar, 6.
Domestic Science, 4.
European History, 5.
Physical Geography, 7.
Elementary Algebra, 2.
Geometry, 5.
Latin Grammar, 4.
Elementary Latin Prose Composition, 2.
Latin, 1st year, 5.
Latin Prose Composition, 3.
Latin Prose at Sight, 4.
Cicero's Orations, 3.
German, 2nd year, 11.
German, 3rd year, 3.
Musical Form and Analysis, 1.
Acoustics and History of Music, 1.
Rudiments of Music, 5.

The record of the Regents examinations for the year is as follows:

Number of examination days, 10.
Pupils examined, 59.
Subjects covered, 29.
Answer papers written, 185.
Answer papers claimed, 155.
Papers allowed by Regents, 151.

The following table gives the results of the examinations held from 1904 to 1910:

	Number examined.	Number claimed.	Number allowed.	Per cent claimed of number examined.	Per cent allowed of number examined.	Per cent allowed of number claimed.
1904	157	121	121	77.07	77.07	100.00
1905	218	173	169	79.36	77.52	97.68
1906	166	95	94	57.23	56.62	98.95
1907	172	157	155	91.28	90.11	98.72
1908	203	170	169	83.74	83.25	99.41
1909	162	149	145	91.97	89.50	97.31
1910	185	155	151	83.78	81.62	97.41

The following are the statistics of the certificates received by the pupils of this school since we began to take Regents' examinations in 1891:

Number who have earned Preliminary Certificates	123
Number who have earned 12 Count Certificates	17
Number who have earned 18 Count Certificates	13
Number who have earned 24 Count Certificates	14
Number who have earned 36 Count Certificates	21
Number who have earned 48 Count Certificates	7
Number who have earned 54 Count Certificates	4
Number who have earned 60 Count Certificates	2
Number who have earned 67 Count Certificates	1
Number who have earned 72 Count Certificates	3
Number who have earned 81 Count Certificates	2
Number who have earned 82 Court Certificates	1
Number who have earned 88 Count Certificates	1
Number who have earned 96 Count Certificates	2
Number who have earned 108 Count Certificates	1
Number who have earned 114 Count Certificates	1

The following is a list of the pupils present during the year 1909–1910, who have earned Regents' certificates under the new scheme of values:

Preliminary Certificates.

Morris Alpersten,
Charles Baumann,
George E. Callan,
Lawrence P. Collins,
Charles Comon,
Catherine Cohen,
William Chambers,
Walter Hallenbeck,
Samuel Herman,
Mary F. Hale,
Emily T. Heil,
Axel Hagerman,
Henry Krey,
Joseph Kirby,
Albert C. Kuchler, Honor,
William Lindner,
Milton Loewnstein,
Josephine Piechocinski,
Elizabeth Payne,
Joseph Reichard,
John Richardt,
Samuel Rosenman,
Sarah Steinburg,
George Taglang,
Bernhardt Fogel,
D. Lena Vogt,
Lucy Williams.

18 Count Certificates.

Charles Baumann,
Charles Comon,
Catherine Cohen,
Lawrence P. Collins,
William Chambers,
Emily T. Heil,
Samuel Herman,
Albert C. Kuchler,
Elizabeth Payne,
Joseph Reichard,
Sarah Steinburg,
D. Lena Vogt,
Lucy Williams.

36 Count Certificates.

William Chambers,
Lawrence P. Collins,
Charles Comon,
Catherine Cohen,
Samuel Herman,
Emily T. Heil,
Albert C. Kuchler,
Elizabeth Payne,
D. Lena Vogt,
Lucy Williams.

54 Count Certificates.

Emily T. Heil,
Albert C. Kuchler,
D. Lena Vogt,
Lucy Williams.

72 Count Certificates.

D. Lena Vogt.

At the end of the report may be found programmes of the Anniversary Exercises, of the recitals given from time to time during the year, a list of literary publications in New York Point Print, a list of works on Music Culture, and a list of compositions for piano and organ in New York Point, with the names of their editors, or of publishers of ink print editions, so far as could be ascertained. The pianoforte music is also classified by years.

Respectfully submitted,

EVERETT B. TEWKSBURY,

Principal.

ANNUAL REPORT

OF THE

Superintendent of Public Works

ON THE

CANALS OF THE STATE

FOR THE

Year Ended September 30, 1910

AND ON THE

Trade and Tonnage of the Canals for the Year 1910

TRANSMITTED TO THE LEGISLATURE JANUARY 23, 1911

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

STATE OF NEW YORK:

OFFICE OF SUPERINTENDENT OF PUBLIC WORKS,

ALBANY, N. Y., *January* 23, 1911.

To the Honorable the Speaker of the Assembly:

I have the honor to transmit herewith the report of my predecessor, Hon. Frederick C. Stevens, as Superintendent of Public Works, for the year ended December 31, 1910.

Very respectfully,

CHARLES E. TREMAN,

Superintendent of Public Works.

STATE OF NEW YORK

No. 16.

IN ASSEMBLY

January 23, 1911.

REPORT OF SUPERINTENDENT OF PUBLIC WORKS

STATE OF NEW YORK:
Office of Superintendent of Public Works,
Albany, N. Y., *January* 3, 1911.

To the Honorable the Speaker of the Assembly:

Sir.— Complying with the requirements of the statute, I submit herewith the annual financial report of this Department for the fiscal year ended September 30, 1910, embracing disbursements for ordinary repairs and operating expenses; a statement of the trade and tonnage upon the canals during the season of navigation of 1910; also a statement as to the condition of the canals and of the work of improvement connected therewith, under special appropriation, in progress or completed during the year ended December 31, 1910; and the expenditures on account thereof; also, a brief statement as to the special bureau work under the jurisdiction of this Department; and also a statement as to the status of the so-called Barge canal work as authorized by chapter 147 of the Laws of 1903, embracing a copy of a communication transmitted to Governor Horace White in reply to inquiries made by him as to the character and status of such improvement.

FREDERICK C. STEVENS,
Superintendent of Public Works.

REPORT.

Office of Superintendent of Public Works,
Albany, N. Y., *January* 3, 1911.

To the Honorable the Legislature of the State of New York:

I have the honor to submit, as required by statute, a report as to the condition of the canals of the State, the improvements and repairs made on the canals during the year just passed, and as to the moneys received and expended, as well as a statement of the trade and tonnage of the canals during the season of navigation of 1910. I also submit details of work on the so-called Barge canal improvement and submit certain recommendations.

NAVIGATION AND TONNAGE.

That there was a falling off in canal tonnage during the season just closed, in comparison with the season of 1909, will cause no surprise among those who are familiar with traffic conditions, nor is this falling off indicative of anything excepting the transition period. It merely reflects and emphasizes the fact that with the canal improvement going forward, new capital is not seeking investment in the building of new canal craft.

As has been pointed out from time to time since the Barge canal work was undertaken, few if any boats of the horse type are being constructed to take the place of those which, on account of age or neglect, and sometimes both, have fallen by the way.

The total business on the canals for the past season is represented by 3,073,412 tons, as against 3,116,536 tons in 1909, a falling off of 43,124 tons. As in previous recent years, the bulk of this tonnage is represented by way freight, the total way freight being 1,684,436 tons east and 583,796 tons west, making a total of 2,268,232 tons way traffic east and west, as against 494,208 tons through freight east and 310,972 tons through freight west, or a total of 805,180 tons through freight for the season, this being compared to a total of 763,899 tons through freight for the season of 1909, a gain of through freight over that of last year of about 40,000 tons, so that it will be seen the real loss was in way shipments.

Of this total tonnage, of through shipments, 2,178,644 tons were eastern shipments as against 894,768 tons shipped west.

The tonnage by canals was: Erie canal, 2,023,185 tons; Champlain canal, 684,027 tons; Oswego canal, 110,079 tons; Cayuga and Seneca canal, 80,125 tons; Black River canal, 175,-996 tons. This is a falling off in shipments on all canals, excepting in the case of the Black River canal, on which the shipments were 146,430 tons in 1909, a gain for 1910 of nearly 30,000 tons. The total value of shipments on all canals in 1910 was $59,042,178, as against a total value in 1909 of $59,081,572.

As to commodities, the greatest decreases were in timber, the 1910 shipments being represented by 1,540 tons, as against 8,566 tons in 1909; in pulp wood, there being 177,171 tons in 1910 as against 189,689 tons shipped in 1909; in wheat, 179,250 tons in 1910 as compared with 191,855 tons in 1909; in rye, 2,380 tons in 1910 as against 6,102 tons in 1909; in barley, 44,440 tons in 1910 as against 50,476 tons in 1909; in pig iron, 31,165 tons in 1910 as compared with 37,302 tons in 1909; in domestic salt, 110,617 tons as compared with 124,056 tons in 1909; in ice, 73,350 tons as against 129,545 tons in 1909; and in anthracite coal, 284,702 tons in 1910 as against 300,607 tons in 1909.

On the other hand there were increased shipments in wood pulp, there being a total of 22,910 tons in 1910 as compared with 9,703 tons in 1909; in corn, 123,190 tons as against 79,459 tons in 1909; in oats, 84,408 tons in 1910 as against 79,564 tons in 1909; in hay, 20,704 tons in 1910 as against 13,680 tons in 1909; in flaxseed, 11,070 tons as against 3,565 tons in 1909; in general merchandise, 178,996 tons as against 155,455 tons in 1909.

The navigation of the present canals during the period of construction and improvement presents a problem of constantly increasing difficulty. That this would be so undoubtedly was foreseen by those who were instrumental in bringing about this improvement, but that boatmen, forwarders and shippers have fully realized all these difficulties may be questioned; for even in the face of several seasons' actual experience the shipping and boating interests have appealed to the Department for relief from conditions for which the construction statute makes provision.

In the case of several contracts which are in alignment with the existing canal, the maintaining of traffic between May 15th and November 15th undoubtedly has tended to hinder construction work. In other cases, work done during the closed season in accordance with the contract, involving the repair and reconstruction of existing structures, has tended to render the maintenance of navigation during the open season exceedingly difficult.

When the time came for announcing the date for the opening of navigation for the season of 1910, the announcement, besides calling attention to the fact that May 15th was the date authorized by statute, also announced that the canal would be closed on November 15th as provided by statute. The desire on the part of boatmen, forwarders and shippers to begin their season of operations was so great, however, that constant appeals came to hand from these interests in behalf of an earlier opening date: and when the season was about drawing to a close, the appeals for an extension of the season beyond November 15th became next to irresistible. All of this resulted in a careful inquiry being made by this Department as to the relations between boatmen and contractors, as to their inter-laced interests, and as to the comparative benefits to each of these interests which would result from a shifting of the open season.

From the studies made by me, I am convinced that the period from May 15th to June 1st for construction purposes, the contractors having their plants in full operation, is far more valuable to contractors than the period from November 15th to December 1st; and on the other hand, I am as fully convinced that the period from May 15th to June 1st, from the standpoint of boatmen, forwarders and shippers, is of less consequence than the period from November 15th to December 1st. All of the existing contracts have embodied a section providing that construction work shall not interfere with navigation between May 15th and November 15th.

Believing that it would be in the interests of boatmen, shippers and forwarders, as well as in the interest of a better progress of construction work, I sent a communication to each of the Barge canal contractors, requesting to know whether in the event that the Legislature should see fit to change the period of navigation from May 15th–November 15th to June 1st–December 1st, they would agree to accept a modification of their contracts in accordance with such amendment of the statute, and I also addressed communications to commercial bodies and individual boatmen, forwarders and shippers and all other interests, requesting to be advised whether in the judgment of those addressed the change in the season of navigation would not be desirable.

In the case of the canal contractors, with one or two exceptions, all have expressed a willingness to accept such modification of their contracts. In the case of shipping interests, by far the larger number of those addressed have given favorable replies to my communication.

This suggested change would have the effect of neither shortening nor lengthening the navigation season, but would be merely a shifting of that season. Personally, I believe the change is a very desirable one to make, and that it would result in great benefit to all interests and that it would be detrimental to no one. Should such an amendment be considered by your honorable body, the records of this Department, which bear on the subject, would be available for your use, and while there might be slight opposition, I believe such opposition would arise from ignorance of the actual change involved, and that when the question was thoroughly discussed by your committee, as could be done, any and all opposition to the suggested change would be withdrawn. I therefore heartily recommend such suggested change.

BUREAU OF CLAIMS.

The efficiency of the bureau of claims as well as the great assistance it is to the State in the defense of claims brought against the State on account of the canals, is shown by the following summary of the work performed by this bureau during the year just passed. By far the larger number of claims investigated by this bureau and either dismissed without award or discontinued for but a small proportion of the amount claimed were brought against the State by reason of alleged leakage and overflow from the canal. The system heretofore established by the Superintendent of Public Works of requiring daily reports from bank watch, water and feeder tenders as to water levels, as to leakage and as to other facts and incidents which might have a bearing on any possible future claim, has been continued and has been found of inestimable benefit in the defense of such claims.

There were disposed of, during the year 1910, 758 claims brought against the State, of which 569 covered alleged damages on account of leakage, overflow and personal injuries. While the total of these 569 claims was $665,145.46, the amount awarded by the Court of Claims on account of such claims was but $19,023.91, the very great difference existing between the amount claimed and the amount finally recovered representing largely the energetic work of the claims bureau in securing evidence in defense of such claims and otherwise assisting the Attorney-General in preparing for the trial of the actions. The remaining 189 claims which were disposed of during the past year were claims brought on account of the Barge canal improvement, being made up mostly of claims for lands appropriated by the State; and of these 189 claims 52 have been disposed of by the Court of Claims, the amount recovered being $138,743.59 as against a total of $1,602,028.26 demanded by the parties bringing such claims. No awards have as yet been reached in the remaining 137 cases, these matters being held pending the approval by the Attorney-General of certain abstracts of title. The total amount claimed in the 137 cases not finally settled is $3,628,401.06, but it is confidently expected, when the awards in these cases are finally made, the total recoveries will be found to be greatly under that sum.

Of the claims filed against the State during the year ended December 31st, 1910, there was a total of 537 with a total in dollars and cents of $7,561,143.47. These are made up of 451 claims on account of the Barge canal improvement with a total of $7,462,630.34, and 86 claims on account of leakage, overflow and personal injuries on account of the existing canal system, with a total of $98,513.13.

Of the 569 claims brought against the State and disposed of during the year 1910, and covering damages on account of leakage, overflow, etc., from the present canals, 475 claims were of no avail to the parties bringing the same, 24 such claims, with a total of $25,435, having been discontinued by stipulation without trial, and 451 such claims, with a total of $428,251.68, having been dismissed after trial. Included in these latter claims were 144 claims brought on account of leakage and overflow along the Black River canal, with a total of over $347,000, and 304 claims brought on account of the construction of bridges over the canals, with a total of about $75,000.

Of the claims on account of the Barge canal improvement, disposed of by the Court of Claims during the year just passed, 27 were claims tried by the court in 1908, the total awards being $394,688.90 as against a total claimed of $3,542,119.26; and 31 were claims tried in the year 1909, the total recoveries being $80,027.89 as compared with a total demanded in such claims of $284,014.92.

In order that the organization of this bureau and its efficiency may be retained and continued, I recommend that the usual annual appropriation of $15,000 for its support and maintenance be made.

SPECIAL EXAMINER AND APPRAISER.

In the work of the special examiner and appraiser, the same procedure described in my previous annual report, that of assigning an agent of this Department to the work of making observations of and placing valuations on property about to be taken by the State for the purposes of the Barge canal improvement, has been continued, and as I believe, has been productive of good results. By means of this method, when the agreements made by the special examiner and appraiser with property owners are presented to the Superintendent of Public Works for his approval and submission to the Canal Board, the Superintendent of Public Works has means at hand to enable him to give an intelligent study to the agreements presented to him for approval, and is therefore in position to discover and check any injustice or unfairness, either to the State or to the property owners, which may exist in any such agreements.

The work of the special examiner and appraiser has had to do with every contract awarded for Barge canal construction work. During the year 1910, 233 agreements with property owners were entered into, with a total of $1,639,769.97; these agreements covering 318 separate parcels of land on 36 different contracts for Barge canal work. The total number of agreements entered into with property owners for lands taken on account of the Barge canal improvement, since the beginning of the work, and without any recourse whatever to the Court of Claims, is 674, with a total in dollars and cents of $2,980,045.14.

NAVIGATION BUREAU.

The work done by the inspectors of steam vessels during the year 1910 included the issuing by them of 72 master's licenses, 10 being of the first issue and 62 being renewals of former licenses; of 92 pilot's licenses, 38 being originals and 54 renewals; of 215 licenses to pilots and engineers, 78 being original licenses and 137 being renewals; and of 546 licenses to engineers, being made up of 55 original licenses and 112 renewals of former licenses; or a total licenses issued by this bureau of 546.

The number of vessels inspected by these officials and to which certificates were issued was 296, this number being made up of 88 steam vessels and 208 motor boats. In addition to this, the inspectors have withheld their certificates from 86 vessels owing to non-production of necessary affidavits. During the season vessels to the number of 201 were found to be deficient by the inspectors and orders for their repair were issued.

The fees collected by the inspectors for inspections, examinations, licenses and renewals, under the provisions of section 34 of the Navigation Law, during the year 1910, amounted to $4,260.00.

WORK UNDER SPECIAL APPROPRIATIONS.

During the past year the work of constructing a lift-bridge over the Erie canal at Franklin street, Syracuse, as authorized by chapter 453 of the Laws of 1909; and the work of constructing a highway bridge over the Erie canal at South Washington street, Rome, as authorized by chapter 522 of the

Laws of 1910, was placed under contract; and the work of constructing a new lift bridge over the canal at Seneca street, Utica, as authorized by chapter 454 of the Laws of 1909, and a highway bridge over the Erie canal at Georgia street, Buffalo, as authorized by chapter 452, Laws of 1909, has practically been completed.

With its own forces, the Department has progressed and brought to completion the work of improving Oriskany creek feeder in the town of Kirkland, Oneida county, the same having been authorized by your honorable body at its last session; and has also, under the provisions of chapter 522 of the Laws of 1910, brought to completion with its own forces a new concrete bridge over the State feeder at Cedar street in the city of Oneida.

In addition to the work authorized to be done by special acts, the several improvements authorized by items in the Supply Bill (chapter 513, Laws of 1910), to be done under the direction of the Superintendent of Public Works, were taken up and progressed to completion by department forces. This work included: Restoring the embankment of Moyer creek, which had been destroyed by flood, and cleaning out of the bed of such creek in the village of Frankfort; the rebuilding and extending the wall along Steel's creek, north of the canal, in Ilion; the repair of the two State dams and the locks therein situated on State land on the Saranac river between Middle Saranac lake and Oseetah lake and making the waters navigable and safe; the repair of highway bridges over the Eighteen Mile creek in the towns of Lockport and Newfane; and of the bridge over Otsquago creek at Fort Plain; the improvement of the State ditch in the town of Tonawanda; and repairing the bridge over the Keuka lake outlet at Liberty street, Penn Yan. The installation of wires and other equipment for the purpose of lighting by electricity the lighthouse at the entrance of the channel on Lake Keuka at Penn Yan has also been accomplished.

The work of improving the Cayuga Inlet at Ithaca and constructing bridges over the same as authorized by chapter 267 of the Laws of 1908, was continued and practically brought to completion, as was also the improvement of the Black river canal and its structures between Rome and Boonville, as provided by chapter 196 of the Laws of 1909.

During the navigation season just passed, the greatest attention was paid by the Department's employees to the care and maintenance of the towing-path of the canal, and no effort was spared in keeping the same in splendid condition. I believe that, excepting such portions as may be interfered with by Barge canal work, the towing-path has never been in better condition for the towing of boats than during the past several seasons.

BARGE CANAL CONSTRUCTION.

As to the progress of work on the Barge canal, the character of construction and all other phases of this improvement, I feel I can not do better than to transmit to your honorable body a copy of the communication which I addressed to Hon. Horace White, Governor, under date of December 19, 1910, in reply to a letter received from him. making inquiry as to some special features of this improvement. I therefore submit to you such lettter:

State of New York,
Superintendent of Public Works,
Albany, *December* 19, 1910.

Hon. Horace White, *Governor, State of New York, Albany. N. Y.:*

Dear Sir.— In reply to your letter of the 8th instant in which, after referring to the importance of the Barge canal as a public project, to the physical difficulties surrounding the construction work, and to the desirability of placing before the public a statement showing completely and thoroughly the conditions as they obtain at the present time, you request from me a statement as to the "situation presented by the constitutional and statutory provisions, the character of the work up to this time and such recommendations" as I may see fit to offer, I have to say:

Both from study and observation made in the past four years during which I have had official relation to the Barge canal work, I am convinced that the public has never thoroughly appreciated the importance or possibly far-reaching results of the authorized improvement, nor the difficulties surrounding the carrying on of the work to a successful completion.

If I understand your first request correctly, that I should give my views as to the situation presented by the constitutional and statutory provisions, it is that I should express an opinion as to the adequacy of chapter 147 of the Laws of 1903 and the amendments thereto, to effect the completion of the work authorized by such statute in proper manner and within a proper period of time.

My above statement in which the realization by the public generally as to the importance of this work is questioned is partially prefaced on the provisions of the authorizing statute, assuming, of course, that this statute, being in the form of a referendum and having been approved by popular vote, was an expression of popular opinion.

The original statute was specific as to some things and carries with it a suggestion of a close study of the general problem of canal improvements by those who had the legislation in charge, and also it contains certain provisions clearly intended to safeguard the work and the State's interests in all particulars. While the desirability of all these was most commendable and exhibited care and foresight, nevertheless some of these provisions neither tend to the most rapid progress of the work nor to its accomplishment by the most economical methods. That this conclusion is one not recently arrived at is shown from the fact that statements similar in effect have been made by me in each of my several reports to the Legislature covering the period of my administration.

There was and is in the original act such a division of authority as to make it difficult in the event of criticism either as to the adequacy of plans, the progress of the work or its character, to definitely locate full responsibility. Section 3 of the act, among other things, states:

> "Within three months after issuing the said bonds or some part thereof the Superintendent of Public Works and the State Engineer are hereby directed to proceed to improve the Erie canal, the Oswego canal and the Champlain canal in the manner hereinbelow provided."

After which follows in detail the general route to be chosen, and in general, the character and dimensions of structures.

Section 6 of the act, after providing that all of the work shall be done by contract, further provides:

> “Before any such contract shall be made the State Engineer shall divide the whole work into such sections or portions as may be deemed for the best interests of the State in contracting for the same, and shall make maps, plans and specifications for the work to be done and materials furnished for each of the sections into which said work is divided and shall ascertain with all practicable accuracy the quantity of embankment, excavation and masonry, the quantity and quality of all materials to be used and all other items of work to be placed under contract and make a detailed estimate of the cost of the same, and a statement thereof with the said maps, plans and specifications, when adopted by the Canal Board, shall be filed in his office and a copy thereof shall be filed in the office of the Superintendent of Public Works and publicly exhibited to every person proposing or desiring to make a proposal for such work.”

As bearing on my construction of the meaning of this provision. I quote from my annual report for the year 1907:

> “From the study that I have given this Act since I have assumed the duties of my office, I have become clearly convinced that the intent of the framers of this Act, as it was also the intent of the Legislature in passing the Act, was to require that no work should be undertaken until detailed plans and specifications for the whole improvement should be matured, following such solution of engineering problems as might be met with; and that it was clearly the intent that bids should be invited covering the whole of the work, which work, however, was to be divided ‘into such sections or portions as may be deemed for the best interests of the State in contracting for the same.’ Certainly, this view of the meaning of the words of the Act, quoted, is in keeping with the provisions of the Finance Law, which provides in section 35, as amended by chapter 580, Laws of 1899:
>
> “‘A state officer, employee, board, department or com

> mission shall not contract indebtedness on behalf of the state, in an amount in excess of money appropriated or otherwise lawfully available.' "
>
> "And section 38 of the same law, as amended by chapter 479 of the Laws of 1899, provides:
>
> " 'A contract or contracts made in pursuance of an appropriation by the state for a specific object shall be for the completion of the work contemplated by the appropriation, and in the aggregate shall not exceed the amount of such appropriation. A contract for a part of such work shall not be binding upon the State until contracts are also made covering the entire work contemplated by such appropriation * * *.' "

These views both as to the intent of the law and as to the wisdom of applying it, I still hold, though I am aware that very brilliant lawyers who were consulted at the time this question was raised by me, rendered the opinion that the point was not well taken; and though fully aware also that the pro-canal interests which were exceedingly anxious that the work should be started as promptly as possible after the Act became effective, fully approved the methods pursued. While this may have been the proper manner of emphasizing their enthusiasm, I then believed and still belive the method was short-sighted as a business policy, since, aside from the cost of plant by multiplicity of contracts, aside from the uncertainty as to final cost and aside from the many difficulties which may beset it, the cost to the State in the matter of engineering and other supervision must be greatly increased as the result of any increase in the length of the construction period.

In other words, had what I term the " make haste slowly " policy been adopted at the inception of the work, had the whole work been divided " into such sections or portions as may be deemed for the best interests of the State in contracting for the same," and had " maps, plans and specifications for the work to be done and materials furnished for each of the sections into which said work is divided " been prepared after all the engineering problems to be considered had been solved, the actual construction work would not have been begun so soon but the completion of the improvement in my mind would be nearer at hand.

At the present time the total work under contract in dollars and cents is $67,209,652.12, exclusive of alterations, some of which increase the cost of the work, while others effect a decrease or saving. In addition, there are now pending contracts on which bids will be received on the 20th and 21st of the present month, aggregating $5,525,910, these contracts included in such total being outside of the work of improving the Cayuga and Seneca canal which was authorized by chapter 391 of the Laws of 1909. Bids will also be received on the 21st of the present month on two contracts for the Cayuga and Seneca canal improvement, such contracts having a total of $2,225,683.

Of the contracts awarded up to the present time, there were in force on January 1st last, contracts with a total of $53,856,940.99, the balance having been placed under contract at different times since then.

On these more recent contracts with the exception of a few of the smaller pieces of work, contractors are still engaged in assembling plant and machinery so that progress thereunder in actual construction work is not yet under way.

The total payments to contractors on account of the progress of work up to November 1st were $21,787,687.82.

I send you herewith a tabulated statement giving the percentage of work done on each of the separate pieces of work under contract up to December 1st, and an analysis of conditions existing on the several contracts as shown by this percentage report of the work will better convey to you the actual conditions as regards real progress than any brief statement which can be made.

Before submitting my annual report for the year 1907, I studied carefully into the question of lack of progress which even then seemed only too clearly apparent, and suggested what to my mind seemed at least contributory causes.

First, a lack of sufficient capital by the contractors; second, (and this in some cases may be closely allied to the first cause) the employment of machinery totally inadequate to the doing of the work in hand; and third, the knowledge on the part of contractors that since only a certain percentage of the whole work was under contract no good reason exists for confining them to their contract periods, since even if completed the portions of the canal embraced within their contracts could not be utilized until the completion of the whole.

There is another cause for the long drawn out period of construction, but for this the statute, and not those who have been charged with the duty of administering the statute, is responsible.

I referred in what was almost my opening sentence to what appeared in my judgment to have been a lack of conception as to the importance and far-reaching effect of this work. Without casting even the faintest criticism on any official who has had to do with this work from its inception, I confess to amazement that so important an undertaking, while apparently clothed with so many safeguards, should have been authorized to be undertaken and carried out by human machinery, which at very best, under our form of government, may not be expected to have such permanency as would enable those conceiving the plans, to interpret them and see them carried out to completion.

Under the statute the inception of the plans is left to the State Engineer and Surveyor, and while section 8 of chapter 147 of the Laws of 1903, provides for the maintenance of a board of advisory engineers and places certain responsibility upon the Canal Board as respects the approval of plans, the interpretation of the plans and the supervision of work during the construction period are duties devolving upon the State Engineer and Surveyor. That official holds office for a term of two years, and rarely in the history of our State government has a re-election been accorded him — never since this work was undertaken. Up to within the past two years, in addition to the gigantic task of conceiving the plans and carrying out the work embodied in the plans, the State Engineer and Surveyor was charged also with the duty of planning and supervising the construction of a system of good roads, besides being given many other duties and responsibilities.

It thus appears that the official charged with the greatest responsibility in connection with this work, and given the greatest authority, is such a one as under existing conditions can give only a portion of his time to the duties in connection with the improvement, and all this under provisions of law he is required to do at the paltry compensation of $5,000 a year. Very wisely, as I believe, the last Legislature made provision, which the Governor sanctioned, whereby the compensation of this official is to be somewhat increased. Nevertheless, in comparison with what is paid by railways, contractors and others having to do with work requiring the services of skilled engineers, the compensation paid to the State Engineer is so small as to be almost ridiculous. That under the circumstances the State has been able to command the services of men of standing as engineers, where their responsibilities are so great and where they are so open to criticism, either justly or unjustly, is not only surprising but gratifying, in that it shows a willingness on the part of citizens to give of their best to the State when the State calls upon them. It has so happened that since the act authorizing this improvement became a law, four different engineers have been charged with the chief responsibility for the undertaking, and a fifth is soon to be inducted into office.

It is but human nature, emphasized in the case of a person of professional standing, to be so jealous of that professional standing as to wish to know of and for himself as to all the details of work for which he may become responsible under his oath of office, and this human trait has been exhibited in connection with this work.

One engineer coming into office would require a period of six months or perhaps a year to familiarize himself with the work, and during this period plans for work which might be well under way would either be at a standstill or else, because of a different viewpoint on the part of the new incumbent, plans would be so changed as to render all previous, or nearly all previous work futile.

During the last six months, or perhaps year, of his incumbency, plans might be rushed toward completion, but failing of actual completion so as to render their approval possible, millions of dollars worth of work would be left on his table or desk for his successor, who in turn, exhibiting the same caution, the same human and very proper instinct, would require a year in a study, a revamping or an entire reconstruction of the plans, and that by this method delay has resulted, can neither be a surprise nor can it be a subject of criticism of officials who under other circumstances could and would be held responsible.

To be specific on this point, just prior to the year 1906, the then State Engineer and Surveyor presented for approval plans for contracts aggregating an estimated cost of about $11,000,000. These contracts were submitted at the meeting of the Canal Board in December, 1906, and included Contracts Nos. 3B, 12, 13, 14 and 20. On January 29, 1907, these plans were withdrawn by the new State Engineer. Of these contracts, what was known as 3B is still pending; No. 12 was resubmitted May 18, 1907; Contract No. 13 was resubmitted July 18, 1908; Contract No. 14, May 28, 1907, and Contract No. 20 was resubmitted August 28, 1907.

In turn just prior to the close of the administration of 1908, contracts aggregating several millions of dollars were submitted, and failing of prompt approval as seemed proper, they were withdrawn by the incoming Engineer, and of these contracts, No. 36 so withdrawn was resubmitted for the approval of the Canal Board September 22, 1909, and Contract No. 42 was resubmitted March 18, 1909.

There are many other examples similar to these cited. I, however, do not cite these as carrying with it a suggestion of criticism of the officials responsible for the act or acts. In a sense it shows extreme care, caution and desire to subserve the best interests of the State, but that it is a criticism of the methods of carrying on so important a work hardly needs to be pointed out.

There is another phase of the work both as relates to the preparation of the plans and to their interpretation as well as to the oversight of the actual progress of work, which has been to my mind a serious handicap to the work and an embarrassment to those having to do with it, but for which they are in no sense responsible. I refer to the legal requirements whereby the State Engineer and Surveyor has little voice in the selection of his force of subordinates, his subordinates being in actuality selected for him by those who have no responsibility for the work and whose selection is based upon a written test — a civil service examination — which may develop a knowledge of books and which may not display an existing ignorance of men, machinery and multitudinous other requirements, the knowledge of which is so essential to effectiveness both in the drafting room and in the field.

Under the existing law, and I am not a disbeliever in a general application of civil service based on merit and fitness, the official charged with the supreme duty and supreme responsibility is bereft of his power for effectiveness in that he is not even permitted to make promotions for merit shown by actual work, being limited in such promotions to selections made by those who have as in the first instance neither authority nor responsibility nor conception of what is actually needed, and whose test is merely academic.

Though I have no intimate knowledge in detail, yet from a general knowledge I know that often it has been necessary to place in charge of work men who come from technical schools who by reason of recent technical studies and reviews secured a high standing, but who have had no actual experience in field work These persons are able to interpret plans and specifications from a textbook standpoint but whose strict textbook interpretation may, and I believe often does, result in detriment to the work and a handicap to the contractor.

In other words, the civil service as applied to an improvement of this kind results in making the State work a gigantic training school for engineers.

I am not criticising the subordinate force of the Engineer as a whole, for that is not my province, and further I believe that in the great body of engineers who have had to do with this work men of capability, experience and devotion to duty outnumber many times over the novitiates.

There are two other minor reasons tending to delay, one of which is authorized by section 8 of chapter 147 of the Laws of 1903, making provision for the establishment and maintenance of an advisory board of consulting engineers; the other, an amendment to section 4 of chapter 147, relative to the appropriation of lands for canal purposes.

Originally, the State Engineer and Surveyor was by this act, in the opinion of the Attorney-General who was called upon to interpret it, given supreme authority. In the exercise of this authority there was appropriated property in the city of Oswego, outside of canal lands as established by the plans for Contract No. 35; and when upon a study of conditions, in the minds of those having to do with the work, other than the State Engineer, no good reason could be seen for the appropriation, the wisdom of the appropriation was questioned, all the more so, in view of the fact that the prospective claim on account of the property proposed to be taken reached the enormous sum of $470,000. The actual taking of this property was contested by myself and others. The attempt to have appraisement made and other steps taken which would render the State responsible was resisted, and the claim finally tried by the Court of Claims was decided in favor of the State.

While many questioned the right of the State Engineer and Surveyor to arbitrarily take property under such conditions, nevertheless it was thought wise to throw a further safeguard around the taking of such property, with the result that the act was amended so as to require that appropriation maps, before being effective, should be approved both by the Advisory Board of Consulting Engineers and the Canal Board.

I speak of this as tending somewhat to a delay in the progress of the work, but, all things considered, I believe it was most commendable legislation, and that the delay entailed is more than offset by the protection it has accorded.

While under the original act, the Advisory Board of Consulting Engineers was given no authority, the Legislature has made certain amendments to the provision relating to this Board, which while placing no responsibility on the board, clothe the Board with some authority. One of the provisions, aside from that heretofore referred to, requires that plans shall be submitted to the Advisory Board, and further provides that the Board may hold said plans thirty days if it so desires, and if this period of time is not sufficient to enable the Board to act intelligently and wisely, an additional thirty days may be had upon request. I am not able to say how much, if any, delay in the progress of plans to the point of adoption by the Canal Board may have resulted from their retention for study purposes by the Advisory Board. As to this the State Engineer can and probably will give you data if any is at hand.

I have referred briefly to what I believe to have been an inadequate study of plans as a whole, and I am confirmed in my belief by the frequent changes which it has been necessary to make in the plans and specifications of innumerable contracts. I am not raising any question as to the wisdom of these changes, some of which have entailed an increase and others have resulted in a decrease in the cost of the particular work. Some, possibly many, of the changes which have been found to be necessary could not have been foreseen even had a longer and closer study been made before placing the work under contract, but that many of these changes, involved in these alterations, could have been foreseen has seemed to me probable. Many of these changes at least are due to the different view-point of one State Engineer and Surveyor as to the effectiveness of plans and methods from that held by his predecessor or former Engineer whose thought and study conceived the plans. Some changes have been the result of direct legislation, but all changes, from whatever cause, of necessity have tended to delay the progress of the work.

A contractor with plans before him on which his contract is based calling for a certain character of construction or structures, plans and provides certain machinery and plant for the carrying out of the work. Sometimes after the plant and machinery have been delivered and installed changes are made which render the plant and machinery so provided almost, if not quite useless, and renders other machinery of a different type necessary.

Entirely aside from the cost to the contractor in such change, there is delay necessitated. In some cases, the necessity for a change of plans is discovered, but what change or how the problem newly discovered is to be solved is not clear to the engineering force, and to determine this point has in some cases involved a study of many months. To be sure, the contractor might be and has been able to progress other portions of his work, but this change in contemplation could not otherwise than result in disarrangement of progress plans, stop the continuity of work and increase the length of the contract period.

Another feature tending to the prolonging of the contract periods is the operation of the existing canals during the construction. Section 11 of chapter 147 of the Laws of 1903 specifically provides:

> " While the work contemplated in this Act is in progress the canals upon which work is actually being done shall not be open for navigation earlier than May fifteenth and shall be closed on or before November fifteenth * * *,"

and this provision has been construed by the canal officials as well as by succeeding Attorneys-General as making it binding upon the State to maintain navigation between May fifteenth and November fifteenth in each year, and the provisions of this section are embodied in all Barge canal contracts.

It goes without saying that construction work which is in the nature of an enlargement of the present canals, can not be conducted with as rapid a progress where there is an interruption during the six months of the year best suited to the carrying on of construction work.

I referred at the beginning of this communication to the fact that one cause for delay was inadequate machinery and insufficient capital on the part of some of the contractors. This is an opinion based upon personal observations covering a period of four years. The Barge canal statute, in section 7, contains a provision which undoubtedly is intended to meet just such contingencies. This provision is:

> " If in the judgment of the State Engineer the work upon any contract is not being performed according to the contract or for the best interests of the State, he shall so certify to the Canal Board, and the Canal Board shall thereupon have power to suspend or stop the work under such contract while it is in progress and direct the Superintendent of Public Works. and it shall thereupon become his duty to complete the same in such manner as will accord with the contract specifications and be for the best interests of the State, or the contract may be canceled an readvertised and relet in the manner above prescribed, and any excess in the cost of completing the contract beyond the price for which the same was originally awarded shall be charged to and paid by the contractor failing to perform the work."

Since the beginning of the work this provision for correcting existing conditions has been resorted to in very few cases only. In the case of one contract, known as No. 17, the contractors went into the hands of Receivers in Bankruptcy, and under the clause referred to, the contract was canceled and the work readvertised and relet. One other contract, No. 2, has gone through a similar process, and the work is now again under contract and the contractors are maintaining a satisfactory progress, in my opinion.

In the year succeeding that in which action was taken by the State officials in the case of Contract No. 17, the work on Contract No. 10, located at Fulton, was being conducted in an indifferent manner, and after careful consideration, upon the certificate of the State Engineer and Surveyor that the work was not being conducted to the best interests of the State, the contract work was suspended. In view of the assurances given after such suspension by the contractors as to the furnishing of additional equipment, material and forces, the contractor was put in possession of the work and for a time it proceeded with a fair degree of satisfaction. This increased progress was maintained for only a short time, however, when the contractors, becoming either embarrassed or discouraged, disposed of their contract by assignment. The assignment of the contract was formally approved, and the new interests went forward with the work for a time, when through financial embarrassments caused by the relations of these contractors to other contracts outside the State, they were compelled to go into the hands of Receivers in Equity. This resulted in a practical shutting down of the work for many months. The receivers are now carrying forward this contract under the direction of the Court, and an increased and fairly satisfactory progress is being maintained by them.

In the case of a number of other contracts which had been in force for a considerable period and where lack of progress had been shown from the start, this department, though not charged with the duty of deciding as to this point, has taken occasion to call attention of the Engineering department to existing conditions, and has proffered its aid and co-operation in any efforts which might be made to better conditions.

In several cases, I have expressed the opinion that the lack of progress was so unsatisfactory as to warrant the State Engineer in certifying the contracts to the Canal Board for suspension or cancellation. In several such cases, I have been of the opinion that the State Engineer and Surveyor erred in his judgment when he has concluded not to so certify, but in reaching such decision I believe he has been guided by reasons which to him seemed sound and convincing. It has been argued that in such cases, the delay which would ensue as a result of the cancellation of a contract, such process rendering a revision of the plans and a readvertising of the work necessary, would be so great as to offset the better progress which might be expected from new contracting interests.

There has been the other feature also present when such matter is considered, namely, the litigation which might ensue and the increased cost to the State of the work on this account. In the case of some recalcitrant contractors the State Engineer and Surveyor has believed with me that the work was not progressing as it should be progressed and suggestions have been made that the proper course to pursue would be to suspend the contract and have the work completed by department forces. For several reasons I have been reluctant to advise this course.

In the first place, the same litigation feared as developing in the other case would be present, and what is more serious, while the statute and the contracts specifically provided that the work may be suspended and completed by department forces, nowhere do the statutes make provision for furnishing the Superintendent of Public Works with adequate forces for the progressing of such improvement work. Where work under contract is taken from the contractor and progressed by the State, it should be done only when there was full assurance that a better progress could be made by the State, and while the State would not be handicapped in the matter of funds, the cost of any such work being chargeable against the contractor and his bond, in the matter of forces the department would be required under the statute to select foremen, superintendents and other important men making up the force from Civil Service eligible lists. Under such conditions, the responsible authority ought to be able to go into the open market and get the very best and most experienced men just as a contractor would be able to do, paying such compensation as might be necessary to command the services of proper assistants.

After all, these matters of delay to progress are only of judgment. I suppose Hope springs eternal in the breast of the Engineer the same as it does in any other human breast, and for this reason the State Engineer has been hoping that a better progress would be made, and that, all in all, though conditions are not satisfactory, the State might lose rather than gain by the taking of extreme measures.

As to the character of the work — While section 10 of the act authorizing this improvement provides:

> "All measurements, inspections and estimates shall be made by the State Engineer and the engineers and inspectors appointed by him,"

and that

> "The Superintendent of Public Works may, in the performance of the duties devolving upon him by this act, rely upon the certificates of the State Engineer and his assistants as to the amount, character and quality of the work done and material furnished;"

nevertheless, it was deemed to be the duty of the Superintendent of Public Works to take such other precautionary steps as might be available to the end that all interests of the State so far as the character and quality of the work are concerned might be subserved. The statute itself provided no machinery directly for this purpose, but section 8, which authorized the employment of five expert civil engineers to act as an advisory board of consulting engineers, whose duty it should be "to advise the State Engineer and Surveyor and Superintendent of Public Works, to follow the progress of the work and from time to time report thereon to the Governor, the State Engineer and the Superintendent of Public Works, as they may require or the board may deem proper and advisable," was interpreted as offering means for the keeping of a check upon the character and quality of the work; and therefore the following letter was addressed to the Advisory Board of Consulting Engineers:

"Section 9 of Chapter 147 of the Laws of 1903, provides:

> "'The Superintendent of Public Works may, from time to time, upon the certificate of the State Engineer pay to the contractor or contractors a sum not exceeding ninety per centum of the value of the work performed, and such certificate of the State Engineer must state the amount of work

performed and its total value, but in all cases not less than ten per centum of the estimate thus certified must be retained until the contract is completed and approved by the State Engineer and the Superintendent of Public Works.' "

" You will see from this that the Superintendent of Public Works, though not having field charge of the work in progress, since he is charged with the disbursement of moneys to the contractor or contractors, is jointly, with the State Engineer and Surveyor, held responsible for the character of the work, the more so from the fact that upon completion the work is to be ' approved by the State Engineer and the Superintendent of Public Works.'

" Section 10 provides:

" 'All measurements, inspections and estimates shall be made by the State Engineer and the engineers and inspectors appointed by him. The Superintendent of Public Works may, in the performance of the duties devolving upon him by this act, rely upon the certificates of the State Engineer and his assistants as to the amount, character and quality of the work done and material furnished.' "

" From a joint reading of the two sections quoted above it seems clear that while the Superintendent of Public Works is to pass finally upon the character of the completed structure or structures, and therefore most likely would be held to equal responsibility with the State Engineer in the event that it should develop in the future, after acceptance of the work and final payment had been made, that the work had been improperly done; he could have no first hand knowledge as to such error or imperfection during the progress of the work; and such error or imperfection might be of a character to escape attention at the time of final inspection.

"As Superintendent of Public Works, thus charged with the responsibility of disbursing funds for work over which I have neither the power of supervision nor inspection, I feel it incumbent upon me, in spite of the provisions of section 10 which state that I ' may in the performance of the duties devolving upon me, rely upon the certificate of the

State Engineer and his assistants as to the amount, character and quality' of the work to be done, to avail myself of whatever other machinery the statute places in my hand to the end that nothing may be left undone which might be done to insure accuracy of work and warrant for disbursements to contractors.

"I find that while the statute under consideration has placed upon me — so to speak — very definite, and in fact, co-ordinate responsibilities without co-ordinate authority, it has also wisely provided me with a safeguard in the performance of my duties.

"I refer to section 8 of the Barge Canal Law which authorized the creation of your board by the Governor, and which specifies it as your duty 'to advise the State Engineer and Superintendent of Public Works, follow the progress of the work and from time to time report to the Governor, the State Engineer and Superintendent of Public Works as they may require * * *.'

"In view of the fact that the statute thus provides it as your duty to 'follow the progress of the work' and to 'report thereon to * * * the Superintendent of Public Works as he (they) may require,' I have thought it wise to advise you that in my judgment the actual construction work at various points has reached such a state of progress as to make it desirable to call upon you for the results of your observations in 'following the progress of the work.'

"With no reflection whatever upon the State Engineer or any of his subordinates, I have come to the conclusion that hereafter I ought not to pay any monthly estimates under the Barge canal work until such report from your board has been received as to the satisfactory character of the work covered by the estimate.

"As to the form which such separate reports shall take, I shall leave to your board. For my purposes, it will be sufficient if a form shall be prepared to be attached to each such estimate, setting forth that the work specified in the estimate in your judgment has been done in accordance with the plans and specifications and that the character of the

> work done is in satisfactory fulfilment of contract terms; such certificate or report to be signed by a majority of the members of your board, individually."

Though at first the members of the board raised a question as to the obligation resting upon them to follow the work so closely as to enable them to certify specifically as required, the rule laid down for the guidance of this Department in such matters has been followed from the start and no estimate for work has been paid without there being attached to every such estimate a certificate signed by a majority of the individual members of the Advisory Board of Consulting Engineers.

In addition to this precaution and to the end that I might be personally as familiar with the work in all its character as might be, I have systematically visited all the work under contract twice each year, observing the character of the work, taking note of the methods in its progression and gathering such other information and data as might be; and in addition to this, have made frequent visits to some of the most important contracts when new questions were up for consideration.

As in all such gigantic undertakings, such as this canal work, there have from time to time arisen questions as to methods of securing results, such considerations frequently leading to changes in specifications or plans where satisfactory results did not otherwise seem possible.

In the early part of June last, in company with the State Engineer and Surveyor, members of the Advisory Board and other officials having to do with canal work, I spent nearly two weeks in visiting the different contracts. I made careful note of any conditions observed by me in carrying out the specifications and in progressing the work which to my mind did not promise the most satisfactory results, and upon my return from this inspection trip I carefully reviewed the conditions on much of the contract work as I had observed them, freely criticising where in my judgment criticism was due, and laid the results of my observations before the State Engineer and Surveyor and members of the Advisory Board of Consulting Engineers.

The most flagrant conditions observed by me were those existing on Contracts Nos. 29 and 42, but I am glad to say that as a result of the observations made by myself and the others and the conclusions reached by us, which I believe were coincided in very largely by the Engineering Department, steps were taken to correct the mistakes which I felt were being made in progressing this work.

These changes were in the manner of specifying the construction of embankment and the use of material, and as a result of subsequent inspection I am convinced that results satisfactory to the State are being secured.

In the case of other contracts, some of which were practically completed and others near completion, conditions calling for criticism were pointed out and betterments secured.

Such deficiencies or defects as were pointed out in my report of June 15th as still exist, if any, by careful oversight and vigorous enforcement of contract specifications, can be corrected before final completion and acceptance.

In the case of one contract, namely, No. 45, located at Baldwinsville, which was inspected for final acceptance, certain criticisms were made of some features of the work, and the additional work pointed out as being necessary was insisted upon and done before the work was finally accepted.

In my judgment there are few, if any, cases where work of a deficient nature has been done which either has not been replaced or repaired, or which cannot be and which in the nature of things will be insisted upon being done before the work is passed upon for final acceptance.

One of the most serious features is the early completion of certain structures long before such structures in the nature of things can and will be placed in commission, and the proper preservation of such structures presents an important, if not a serious problem to be dealt with.

Finally, you ask me, by inference at least, to submit suggestions as to changes which might be made to advantage in the conduct of this work. On this point I cannot do better than refer you to the recommendations on this line heretofore submitted to the Legislature.

I am aware that commissions are not popular, and, generally speaking, are not considered an economical means of conducting public business, and, generally speaking, I would not contest this point, but in the case of so great an undertaking as the Barge canal work, it is my judgment that some method should have been devised which would have guaranteed a continuity of the work under a head of recognized ability, and a separate commission for this purpose is the only method I can conceive that would guarantee such results.

I am aware that the framers of this act had the necessity of some such system in mind and that they believed they were furnishing this when provision was made for an Advisory Board of Consulting Engineers, and when later, provision was made for continuing such engineers in charge during the continuance of the work. The weakness of this plan, however, lies in the fact that the advisers are made continuous, whereas the responsible, conceiving and directing force is left changeable, with the results already pointed out, of already having given the work four such separate directing heads.

I have spoken of the inadequacy, as it seems to me, of the compensation provided for one charged with the duties and responsibility of conceiving and directing so large an undertaking.

If a commission composed of three members, the chief of whom should be required to be an engineer, one of whom should be a broad-guaged, experienced man of affairs, and the third an experienced and well qualified attorney, could have been provided and salaries made adequate to command the services of the very best men obtainable, provision being also made for such commission to remain in continuous charge until the completion of the work unless removed for cause, I believe far better results would be attained.

I am aware that it has been pointed out there is constitutional prohibition to such course on account of the powers with which the Constitution clothes the Superintendent of Public Works and the State Engineer and Surveyor. If, however, the constitutional provisions cited should be so narrowly construed, it seems to me they already have been violated in the matter of the authority granted to the Advisory Board of Consulting Engineers.

If, however, such constitutional prohibition does exist, it would seem to me that this objection could have been met by the creation of a commission of five members, of which the State Engineer and Surveyor and Superintendent of Public Works should be *ex-officio* members, retaining to the Superintendent of Public Works certain prerogatives as regards contracting for work, and retaining to the State Engineer and Surveyor certain prerogatives as to the preparation of plans, but rendering the commission as a whole the controlling power. By this means, though the personnel of the Superintendent of Public Works and the State Engineer and Surveyor might change biennially, the majority of the commission would be continuous and there would not be the revising and the new view-points shown to be present in the system that has been followed.

Where there is full authority, full responsibility is easily placed, but where there is a division of authority, it is difficult to place responsibility.

If it be urged that such system would tend to increase the cost to the State for doing the work on account of engineering, I would cite the fact that up to November 1st there has been paid for advisory engineers' salaries and expenses, since the beginning of the work, the sum of $257,482.56. There was paid, up to November 1st, for other engineering, including the making of surveys, the preparation of plans and the supervision of work, the sum of $4,150,406.83.

Delay in final completion of this improvement is not the only objection to be urged against improper progress. It is fundamental that the longer the period of construction in the case of any undertaking the greater the percentage of cost for engineering and supervision.

You will, I believe, understand that none of the seeming criticisms which this communication contains are directed against any individual or collection of individuals or officials who have had to do with this work from its inception. I believe very largely the men having to do with this work have been imbued with a high sense of duty and have taken a just pride in being officially connected with the work. Such criticisms as are contained, or seemingly implied, in this communication, when it comes to last analysis, apply, as I believe you will see, to the manner and methods embodied in the authorizing statute.

In your letter to me you express the fear that the total cost of this work "may exceed the original estimate of $101,000,000 as a result of litigation and damages." The question of final cost is one which at this juncture should be capable of fairly accurate and reliable estimate and determination, but since this is almost wholly an engineering and legal question, I shall not attempt to go into the subject further than to give the data at hand:

The contracts already in force or completed, exclusive of alterations, some of which increase the cost and others of which decrease the cost, one fairly offsetting the other, amount to.	$67,209,652 12
Additional work now being advertised, which, according to the engineer's estimate, will amount to	5,525,910 00
The work for which plans are in progress and not as yet completed, including all work of whatever nature, is estimated to cost about. .	6,000,000 00
Total	$78,735,562 12

To this total should be added the amount of expenditures thus far made for all purposes other than payments to contractors and payments on account of damages	$4,907,617 49
The total awards for damages made through the Canal Board on settlements made by Special Examiner and Appraiser are	2,724,109 82
The total amount of recoveries on account of damages made through the Court of Claims is	989,175 61
Taking the awards thus far made, namely, $989,175.61, on the total of the claims, ($6,574,553.93) gives a percentage of awards of about 15 per cent; and assuming that this percentage is a fair basis for consideration and that the claims thus far adjudicated as a whole are representative of the claims still pending, and applying this percentage to the	

amount still claimed, gives, as the probable future award or recoveries on undetermined claims	$2,056,256 55
Total	$89,412,721 59

The amount of recoveries made through the Court of Claims represents claims whose amounts as originally filed aggregated $6,574,553.93.

The seemingly large total of settlements through the Canal Board arises from the fact that the larger claims, growing out of the appropriations of railway lines or sections of lines, which have resulted in the building of detour lines, such as that at Niskayuna, Rome and other places, have been settled through this board.

The larger claims in the Court of Claims which have been and still are being contested are those for damages on account of interference with water power. One important case which has been regarded as a test case is now on appeal and of course much depends upon the final outcome of this case, but all those having to do with this improvement, including the Attorney-General and his assistants, who have given these cases exceedingly close study and the greatest care, are extremely hopeful that the State's position will in the end be upheld by the Court of Appeals, in which event the final cost to the State on account of damages will be reduced millions of dollars below what otherwise would be the result.

The estimate of $6,000,000 given above for work for which plans are in progress and not yet completed, embraces at least some work which ultimately may be eliminated from consideration. Besides including terminal and harbor at Syracuse, which was provided for by amendment to chapter 147 of the Laws of 1903, and a harbor and basin at Rochester, it includes basin improvements at Albany which were provided for in the original estimate in connection with the improvement of the so-called Albany level of the Erie canal, but which latter improvement, it is understood, there is now no demand for, owing to projected terminals which would render such improvement unnecessary and useless.

This estimate does not include the reconstruction of highway and railway bridges which originally were estimated for in the construction account, since it has appeared to me these should be embraced not in the construction account but in the damage account. In round numbers this amounts to upwards of $4,000,000. The attitude of the State officials having to do with this contract work, however, has been, briefly, that the streams to be canalized were State highways, in the sense of the State's owning fee to the bed of the streams, and that therefore the cost for reconstruction of such bridges should be borne by the railway companies. In pursuance of such decision the Superintendent of Public Works has from time to time, as the completion of plans and progress of work required, officially ordered railway companies operating their lines over such rivers and streams to alter and reconstruct their bridges in such manner as to conform to Barge Canal dimensions and afford navigable conditions without expense to the State.

The question as to whether the State's position in this regard is correct is now before the Court for determination. It is a very important question and one upon which, from Court decisions already had, the Barge Canal act seems to have been deficient, but if so, it is not too late to have these deficiencies corrected. In my annual report I shall speak specifically of this matter and shall recommend legislation which will correct deficiencies, if any exist.

Yours very truly,

F. C. STEVENS,

Superintendent of Public Works.

Since the submission of the letter to Governor White, it has been my privilege to read letters and reports from other officials and others addressed to Governor White on the same subject, and in some of these the wisdom of the suggestions contained in my own communication with reference to the provision for a commission for carrying on the Barge canal construction work is questioned, and by others, while the wisdom of applying such method is not questioned, the Constitutional prohibition is cited as a bar to such procedure. It is also set forth by some that originally construction by commission was favored as being the proper and wise method but that this method was abandoned as it was recognized as being contrary to Constitutional provisions.

I would call your attention to the fact that if originally the commission plan had been thought wise and was abandoned because of the Constitutional prohibition, either a narrow study of the question or an oversight must have been responsible for the abandonment of this proposed method, since chapter 147 of the Laws of 1903 (the Barge Canal Act) is in itself in effect an amendment of the Constitution, having been submitted in referendum form and having been voted on by the people at a regular election before taking effect, and, therefore, so long as this procedure was thought to be necessary and was actually taken, the original act could have embraced any method thought wise without infringing upon Constitutional principles, and without doing violence to rights conferred upon Constitutional authority.

Since transmitting the foregoing communication, awards of additional contracts have been made as follows: Contract No. 48, $1,701,671.50; Contract No. 51, $389,842.50; Contract No. 76, $1,494,057.40; Contract No. 77, $1,652,148.20; Contract No. 80, $117,390.64; and Contract No. 91, $42,940.50, making a total of $5,398,050.74. Therefore, the total of the contracts already awarded for work under chapter 147 of the Laws of 1903 is $72,607,702.86.

EXPENSE OF RECONSTRUCTING BRIDGES OVER CANALIZED RIVERS.

Section 5-a of chapter 147, of the Laws of 1903, provides as follows:

> "Where bridges have heretofore been erected by any person or corporation across canals to be abandoned as herein provided and where the State shall have made compensation to them on account of the expense of constructing bridges for their use in crossing the new routes provided for in this act, those portions of such abandoned canals, over which such bridges extend shall not be sold nor shall it be lawful for such persons or corporations or their successors, grantees or assigns to cross such abandoned canals by struc-

> tures at grade or on embankments until such compensation as the Canal Board shall deem equitable shall be paid into the State treasury by the persons or corporations to whom the State has made compensation as aforesaid, or by their successors, grantees or assigns. In like cases similar payment shall be required before it shall be lawful for any person or corporation to cross the beds of navigable streams or of streams, the property of the people of this State, by structures at grade or on embankments. Any moneys so paid into the State treasury shall be applied as provided in section five of this act."

Attention is called to this provision at this time on account of the interpretation placed upon the provision by Justice Foote of the Supreme Court, the action growing out of the construction of a bridge over the canal, carrying the Lehigh Valley Railway Company's tracks over the same.

The State had ordered the railway company to construct the bridge at its own cost and expense, assuming that because Seneca river which the bridge spans was a navigable stream, the State's rights were unquestioned, and that under the provisions of the Barge Canal Act any changes rendered necessary by canalization of the river must be borne by the company.

Justice Foote, in his decision, held that the Seneca river is a navigable stream and that the State has title to the bed thereof, and to this extent the State's contentions are upheld; but the railway company's contention that the expense of such changes as are necessary by the canalization of the river should be borne by the State is upheld by Justice Foote, on the ground that section 5-a, referred to above, contemplates that all structures of whatever character, railway or otherwise, should be renewed where necessary, and that at the expense of the State.

I am assured that the case in question will be carried to the higher courts, and it is hoped that the State's contention as to the placing of the cost will be upheld finally; but if Justice Foote's decision shall be upheld, and if the State is to be regarded as responsible for the cost of such structures simply because of the wording of the provisions of the section quoted above, it seems to me that your honorable body should, with as little delay as possible, amend section 5-a of chapter 147 of the Laws of 1903 in such manner as to release the State from an obligation which but for the present wording of the act would not exist. Such amendment should be so phrased as to vest in the officials charged with the execution of the Barge canal improvement the power to exercise, in the improvement of navigable streams, the paramount right of the State to cause the removal of obstructions to that improvement without cost to the State.

CAYUGA AND SENECA CANAL IMPROVEMENT.

In my annual report for the year 1908, I called attention to the undoubted opportunities offered by nature for improving the Cayuga and Seneca canal so as to render the same a part of the Barge canal system, and pointed out what seemed to me to be the manifest advantages of such improvement. A referendum authorizing this improvement was passed by popular vote at the general election of 1909.

While means were not at hand for an accurate estimate of the cost of such improvement, from such data as was available I estimated in my report for 1908 that the cost of deepening Seneca river, the Cayuga lake outlet, from the point where the Barge canal enters Clyde river to deep water in Cayuga lake would be about $1,750,000; and also I estimated that the cost of deepening the Seneca river from Mudlock to deep water in Seneca lake would be about $4,000,000, these estimates including the cost of necessary controlling works for the regulating of the waters of Cayuga and Seneca lakes.

When the subject of this improvement was taken up seriously by your honorable body, hearings were had, additional data called for, preliminary surveys made, etc., and there seemed to be a misapprehension on the part of some that the cost as set forth by me in my annual report of 1908 was very far below what the actual cost would be, some figures running as high as $9,000,000. The fallacy of these high figures was shown when the cost of certain work as estimated for was placed in comparison with work on the Barge canal proper, and the cost for which the work was actually being done. In order to provide against any and all contingencies, however, the amount carried in the enabling act was $7,000,000.

Preliminary work on this improvement has gone far enough to indicate that my original estimate of just under $6,000,000 was not far out of the way. Bids were received on Contracts A and B of the Cayuga and Seneca canal on the 21st of December, and awards have been made on these contracts. Contract A provides for constructing Lock No. 1 and Dam No. 1 near Cayuga, and Contract B covers the excavation of a channel mainly in the Seneca river from Montezuma to deep water in Cayuga lake, from Cayuga lake to Seneca Falls, and from Waterloo to deep water in Seneca lake, a length of over seventeen miles. The contract price for which Contract A was awarded is $357,627 as against the Engineer's estimate of $393,133.50, and the price at which Contract B was awarded is $1,448,550 as against the Engineer's estimate of $1,832,550, showing a saving on these two contracts under the Engineer's estimate of nearly $420,000. These two contracts, I believe, can be fairly taken as an index of the cost of work, since Contracts A and B embrace practically all the work, excepting the construction of locks and the necessary channel for a distance of three miles between Seneca Falls and Waterloo. Outside of this work there remains little, excepting the item of land damages, and it is most gratifying therefore that, based on what actually has been accomplished in the way of getting this work under contract, the completion of the Cayuga and Seneca improvement may be accomplished well within the amount provided, and in fact, well within the amount estimated in my original recommendation.

As to the time of completion, I believe that with fair energy on the part of those who will be charged with the responsibility, the Cayuga and Seneca canal improvement may be completed as early or even before the final completion of the Barge canal proper.

If the season of navigation dates are changed on the other existing canals, they should also be changed as applying to the Cayuga and Seneca canal, and in fact, if provision could be made for closing the Cayuga and Seneca canal entirely for the seasons of 1911 and 1912, the work would be simplified, the rate of progress accelerated and the cost to the State materially reduced, and I believe this could be done without serious detriment to any shipping or boating interests.

On Contract B one of the items of cost is $15,000 per season for three seasons for maintaining navigation. If navigation were to be suspended, this item of cost to the State would be eliminated. In the case of contracts not yet awarded, if navigation were to be suspended, very much lower prices, without doubt, would be received by the State.

PUBLIC HIGHWAYS INTERFERED WITH BY BARGE CANAL WORK.

One of the complications that has arisen in connection with construction work on the Barge canal is that having to do with highways. At many points, existing highways have been interfered with and the construction of new highways rendered necessary. There being no provision in chapter 147 of the Laws of 1903 for the construction of such highways, it has been necessary to fall back upon the provisions of section 120 of the Canal Law (chapter 13 of the Laws of 1909), which specifically provides for the construction of new highways by the Superintendent of Public Works where an existing highway is interfered with in connection with any canal improvement, and provides for the taking of the necessary land for such purposes; and on completion of the new highway, for the transfer of such highway to the town authorities for supervision and maintenance.

This has been an awkward method of handling the several cases that have arisen, but it has seemed to be the only course which could be pursued, unless the highway were to be completed and maintained as a State highway, this involving liability as well as the cost of maintenance.

I therefore recommend that the Barge Canal Act (chapter 147 of the Laws of 1903) be so amended as to specifically authorize the construction of necessary highways to replace highways interfered with, such amendment to specifically provide also for the dedication of such highway when completed to the town or county authorities, such dedication to constitute a release to the State from all liability and from future maintenance.

REGULATION OF MOTOR BOATS AND OTHER PLEASURE CRAFT NAVIGATING THE STATE CANALS.

The question as to making some provision for the regulation of motor boats navigating the canals has been discussed from time to time, and several methods to reach this end have been proposed. Up to the present time no legislation has been had. The use of the canals by pleasure craft has come to be a very important matter, the number of boats as represented by navigation permits issued increasing rapidly during the last several years. Ten or a dozen years ago, the total number of permits issued during the year would not reach more than a few dozen, or at greatest, not more than a hundred, and the number has so increased that during the year 1910 upward of 2,000 such craft were given navigation privileges.

This increase is due to new methods of propulsion, to the decrease in the cost of constructing such craft, and to the growth in popularity of this method of sport and recreation. The use of the canals by pleasure craft, when the Barge canal shall be completed and put in commission, is going to present a serious problem, and while the canals are intended mainly for commercial traffic, their use can hardly be denied to other traffic so long as such other traffic is properly regulated.

The federal authorities have had something of this same problem to contend with and have sought to solve it by an act of Congress approved June 9, 1910, known as "An act to amend laws for preventing collisions of vessels and to regulate equipment of certain motor boats on the navigable waters of the United States."

I recommend that the so-called Inland Waters Navigation Law be amended by adding a provision which will embody the same regulations and requirements for craft navigating the inland waters over which the State has jurisdiction as the act of Congress makes requisite for boats navigating waters under federal jurisdiction.

CHARTING OF LAKES AND RIVERS FORMING PART OF THE BARGE CANAL SYSTEM.

While no charting of the present canal system of the State has thus far been necessary, owing to the simple methods of navigation, the almost straight alignment of the canal prism and its uniform depth, a different condition will be presented by the Barge canal system upon its completion. A large portion of the Barge canal system when completed will consist of open lake navigation and river sections where the channel will be tortuous and of varying width and depth, hence in order that the new system may be navigated with ease and safety, charts must be supplied to navigators showing the condition of the waters at all points.

There is every reason to believe that vessels, or some of them at least, navigating the Great Lakes, St. Lawrence river, Lake Champlain and the Hudson river, and to a certain extent carrying traffic along the Atlantic coast, will navigate the Barge canal system, and for this reason any charts made for the Barge canal system should be standardized with those in use by the United States and Canadian governments.

The United States now maintains a lake survey department for surveying and charting the northern and northwestern lakes and connecting rivers and harbors, and such department has standardized a chart of those lakes and rivers showing in colors the various depths of the waters navigated. This chart has become so useful and popular with navigators of the Great Lakes that the Canadian government has adopted similar colors for the charts made by it. It is understood that the United States Navy Department as well has adopted similar colors in all charts used by it.

Therefore, to the end that those using the navigable waters of this State may have a chart of a form uniform to the charts covering federal and Canadian waters, if the Barge canal system of this State shall be charted, it is desirable that the system of colored charting similar to that used by the federal government in its lake survey should be adopted.

Inasmuch, however, as no department of the State government has equipment or organization for a proper charting of the Barge canal system, and inasmuch as none could be provided or organized except at large expense, and inasmuch as the federal government already has a complete equipment and organization for the doing of such work, I believe that if the aid of the Federal government were solicited in the work of charting such lakes and rivers as have been made a part of the Barge canal system, such aid would be readily extended, especially in view of the fact that the Barge canal when completed will form part of the system of waterways of which the Great Lakes are a part.

I therefore recommend that your honorable body address a memorial to Congress, requesting that the federal department having in charge the making of surveys and charts for the northern and northwestern lakes be authorized to extend such surveys and charts so that the same will cover the Barge canal system of this State.

SURPLUS WATERS.

Already steps have been taken by your honorable body in response to recommendations in the annual report for the year 1906 looking to partial protection, at least, of the State's interests where its water power development is concerned. Reference is made to chapter 494 of the Laws of 1907 which forbids the disposition of water power, surplus or otherwise, created in connection with construction work or with structures on and connected with the canals.

This amendment already has been of the greatest benefit to the State in that it has prevented any successful attempt on the part of private interests to secure rights and privileges, but it has not prevented the making of attempts to this end. Several proposals have been made by such interests in different form, which involved either a direct repeal of the statute referred to or its amendment, or which would at least effect its repeal by implication.

To the end that in connection with canal construction work the State might control forever the discharge of waters stored or impounded, and thus being in possession to take full advantage of all rights, legislation was passed, becoming chapter 273 of the Laws of 1909, extending the powers of the State Engineer and Surveyor in the matter of entering upon and taking possession of lands, structures and waters.

If this provision shall be broadly and wisely construed, the State, in connection with canal construction work, will avail itself of all proper methods necessary to a utilization and full control of the waters created and impounded and to be discharged as a result of the construction of any dam, mole or other structure incidental to the canal improvement work.

The only point left in question is as to whether the funds appropriated for the construction of the canal are properly applicable to the purchase by condemnation of such lands and structures, so needed for a full utilization and control of impounded waters. If it shall be determined that the canal moneys are not so applicable, I deem it to be of the highest importance that there should be such supplemental legislation as may be necessary to specifically give to the State Engineer desired authority in providing funds for meeting such necessary expenditures.

As I have heretofore stated, it would be a matter for deep regret if, because of a technicality, those charged with the duty of preparing plans and providing for the carrying out of such plans shall be prevented from or hindered in the process of making adequate provision for the State's deriving so large and so just a revenue as this source already promises.

Respectfully submitted,

FREDERICK C. STEVENS,

Superintendent of Public Works.

Statement of all Expenditures Made by the Superintendent of Public Works, for the Operation, Maintenance and Repairs of the Canals, the Extraordinary Repairs of Mechanical and Other Structures, and Other Work and Expenses Provided for by Special Acts of the Legislature; also on Account of the "Barge Canal."

ORDINARY REPAIR FUND.

For locktending and ordinary repairs of the canals (see Statement No. 1)	$799,730 64	
For administrative expenses (see Statement No. 2)	48,203 08	
For expenses of collectors and compilers of statistics (see Statement No. 3)	14,120 69	
For office expenses of the Superintendent of Public Works and three Assistant Superintendents of Public Works (see Statement No. 4)	32,627 20	
		$894,681 61

EXTRAORDINARY REPAIR FUND.

For repairs and improvements of existing mechanical and other structures and works on and connected with the canals of the State:

Chapter 290, Laws of 1908 (see Statement No. 5)	$74,230 89	
Chapter 437, Laws of 1909 (see Statement No. 6)	125,000 00	
Chapter 533, Laws of 1910 (see Statement No. 7)	30,954 54	
		230,185 43

SPECIAL APPROPRIATIONS.

Expended for various purposes (see Statement No. 8)	$179,038 33

"BARGE CANAL ACT."

Expended as shown on Statement No. 9	8,657,314 91
	$9,961,220 28

A Statement of the appropriations for the operation and repairs and extraordinary repairs of the canals, salaries and traveling expenses of the Superintendent, deputy, three assistant superintendents, clerk hire and office expenses, salaries of section superintendents and collectors and compilers of statistics and inspectors.

YEAR.	Locktending and ordinary repairs.	Repair and improvement of existing mechanical and other structures.	Salaries and office expenses.	Salaries of section super-intendents.	Salaries of collectors and inspectors and incidental expenses.	Reconstruction of the embankments, slope wall and repair of other damages by flood.	Total.
1900	$870,000 00	$350,000 00	$54,064 00	$28,400 00	$25,000 00	....	$1,327,464 00
1901	820,000 00	325,000 00	54,944 00	28,400 00	22,400 00	....	1,250,744 00
1902	820,000 00	250,000 00	56,944 00	28,400 00	17,800 00	....	1,173,144 00
1903	820,000 00	275,000 00	56,944 00	28,400 00	19,700 00	....	1,200,044 00
1904	820,000 00	275,000 00	56,644 00	28,400 00	19,900 00	$75,000 00	1,274,944 00
1905	800,000 00	200,000 00	53,644 00	27,500 00	19,900 00	....	1,101,044 00
1906	775,000 00	150,000 00	53,044 00	27,500 00	18,763 00	....	1,014,307 00
1907	775,000 00	125,000 00	53,544 00	26,000 00	17,263 00	....	996,807 00
1908	775,000 00	125,000 00	57,019 00	26,000 00	17,263 00	....	1,000,282 00
1909	800,000 00	125,000 00	59,344 00	26,000 00	17,463 00	....	1,027,807 00
1910	800,000 00	125,000 00	59,344 00	26,000 00	17,463 00	....	1,027,807 00
Total	$8,875,000 00	$2,325,000 00	$615,479 00	$301,000 00	$212,915 00	$75,000 00	$12,404,394 00

STATMENT No. 1.

STATEMENT *of expenditures, ordinary repairs, for fiscal year ended September* 30, 1910.

CANALS.	Sections.	By Superintendent of Public Works.	By Assistant Superintendents of Public Works.	By Superintendent of Canal Repairs.	Total each section.	Total each canal.
Erie	1	....	$15,797 75	$3,147 35	$18,945 10	
Erie	2	....	20,497 87	6,015 51	26,513 38	
Erie	3	....	12,236 82	1,472 10	13,708 92	
Erie	4	....	7,534 76	1,508 75	9,043 51	
Erie	5	....	24,313 49	16,754 03	41,067 52	
Erie	6	....	18,442 02	21,725 71	40,167 73	
Erie	7	....	7,293 25	12,522 15	19,815 40	
Erie	8	....	12,347 11	26,823 18	39,170 29	
Erie	9	....	34,509 51	27,775 59	62,285 10	
Erie	10	....	20,096 13	34,134 91	54,230 74	
Erie	11	....	34,836 94	23,747 63	58,584 57	$383,532 56
Champlain	1	....	$9,551 79	$20,817 98	$30,369 77	
Champlain	2	....	8,429 15	25,107 59	33,536 74	
Champlain	3	....	4,192 65	14,897 50	19,090 15	82,996 66
Oswego	....	....	$3,173 82	$11,089 81	$14,263 63	14,263 63
Cayuga and Seneca	....	....	$11,896 15	$10,913 54	$22,809 69	22,809 69
Black River	....	....	$18,307 39	$26,483 22	$44,790 61	44,790 61
Division expenses:						
Eastern	....	....	$41,484 27	....	$41,484 27	
Middle	....	....	38,681 13	....	38,681 13	
Western	....	....	41,111 10	....	41,111 10	121,276 50
General expenses:						
Erie, general	....	$16,425 54	....	....	$16,425 54	
Erie	1	45,157 49	....	....	45,157 49	
Erie	2	20,545 16	....	....	20,545 16	
Erie	3	20,503 65	....	....	20,503 65	
Erie	4	23,899 31	....	....	23,899 31	
Black River, general	....	3,529 84	....	....	3,529 84	130,060 99
						$799,730 64

STATEMENT *of expenditures for ordinary repairs and operating expenses on New York State Canals, by divisions, for fiscal year ended September 30,* 1910.

	CANALS	By Supt. of Public Works.	By Asst. Supts. of Public Works.	By Supts. of Canal Repairs.	Totals.
Eastern Division	Erie	...	$56,067 20	$12,143 71	
Eastern Division	Champlain	...	22,173 59	60,823 07	
Eastern Division	Division expenses	...	41,484 27	...	
			$119,725 06	$72,966 78	$192,691 84
Middle Division	Erie	...	$50,048 76	$51,001 89	
Middle Division	Oswego	...	3,173 82	11,089 81	
Middle Division	Cayuga and Seneca	...	11,896 15	10,913 54	
Middle Division	Black River	...	18,307 39	26,483 22	
Middle Division	Division expenses	...	38,681 13	...	
			$122,107 25	$99,488 46	221,595 71
Western Division	Erie	...	$101,789 69	$112,481 31	
Western Division	Division expenses	...	41,111 10	...	
			$142,900 79	$112,481 31	255,382 10
General expenses	Erie, general	$16,425 54			
General expenses	Section No. 1, Erie	45,157 49			
General expenses	Section No. 2, Erie	20,545 16			
General expenses	Section No. 3, Erie	20,503 65			
General expenses	Section No. 4, Erie	23,899 31			
General expenses	Black River, general	3,529 84	...	...	130,060 99
					$799,730 64

STATEMENT No. 2.

Statement of Administrative Expenses for Fiscal Year Ended September 30, 1910.

F. C. Stevens, Superintendent of Public Works, salary and expenses	$6,182 15
Winslow M. Mead, Deputy Superintendent of Public Works, salary and expenses	5,691 02
David H. Lewis, Assistant Superintendent of Public Works, Eastern division, salary and expenses	3,476 05
Charles C. Barrett, Assistant Superintendent of Public Works, Middle division, salary and expenses	3,355 25
Henry A. Kunze, Assistant Superintendent of Public Works, Western division, salary and expenses	3,498 61
Jacob M. Grass, Superintendent of Repairs, section 1, Erie	1,500 00
James Scanlon, Superintendent of Repairs, section 2, Erie	1,500 00
Oliver Hurst, Superintendent of Repairs, section 3, Erie	1,500 00
Charles Wallace, Superintendent of Repairs, section 4, Erie	1,500 00
Daniel F. Breitenstein, Superintendent of Repairs, section 5, Erie	1,500 00
E. J. Clark, Superintendent of Repairs, section 6, Erie	1,500 00
A. B. Hallett, Superintendent of Repairs, section 7, Erie	1,500 00
R. A. Vanderboget, Superintendent of Repairs, section 8, Erie	1,500 00
Jacob Allmeroth, Superintendent of Repairs, section 9, Erie	1,500 00
Charles L. Papworth, Superintendent of Repairs, section 10, Erie	1,500 00
William J. Hingston, Superintendent of Repairs, section 11, Erie	2,000 00
John Richmond, Superintendent of Repairs, section 1, Champlain	1,500 00
Patrick O'Grady, Superintendent of Repairs, section 2, Champlain	1,500 00
George Neddo, Superintendent of Repairs, section 3, Champlain	1,500 00
D. S. Burleigh, Superintendent of Repairs, Oswego canal	1,500 00
O. E. Emens, Superintendent of Repairs, Cayuga and Seneca	1,500 00
J. A. Fiske, Superintendent of Repairs, Black River	1,500 00
	$48,203 08

STATEMENT No. 3.

Statement of Expenses of the Statistician and Compilers of Statistics of the Tonnage of the Canals, for the year ended September 30, 1910.

Statistician, salary	$2,200 00
Collectors, salaries	6,515 63
Clerks, salaries	4,500 76
Incidental expenses, stationery, rent of office, coal, etc	904 30
	$14,120 69

STATEMENT NO. 4.

Statement, clerk hire and office expenses of Superintendent of Public Works and Assistant Superintendents of Public Works, for the year ended September 30, 1910.

Albany office	$20,190 25
Eastern division office	3,110 62
Middle division office	4,744 19
Western division office	4,582 14
	$32,627 20

Detailed Statement of "Albany Office" Expenditures October 1, 1909, *to October* 1, 1910.

Salaries and clerk hire	$14,340 78
Special agent	1,200 00
Postage stamps and box rent	655 01
Telegraphing	303 16
Telephone service	484 98
Stationery and printing	2,499 60
Newspapers and directories	12 50
Expressage	231 81
Drinking water for office	28 00
Furniture	7 00
Filing cases	7 00
Legislative indexes	50 00
Water cooler	3 50
Traveling expenses	47 31
Fuel, wood	2 50
Annunciator and repairs	19 60
Notary, qualifying as	5 00
Typewriting machine, repairs	7 50
Newspaper clippings	195 00
Painting office of Superintendent	90 00
	$20,190 25

ERIE CANAL — GENERAL.

October 1, 1909, *to October* 1, 1910.

Special agent, salary and expenses	$926 75
Inspector, salary and expense	1,807 37
Paymaster, salary and expense	2,962 48
Operation and maintenance of State inspection boat	2,884 26
Repairing and altering electric signal system	594 43
Publishing notices, opening and closing of canals	59 50
Recording appropriations of land	75

Identification badges	$540 00
Construction of stairways at Catherine street bridge, Syracuse	750 00
Two automobiles, for Middle and Western Divisions	5,900 00
	$16,425 54

BLACK RIVER CANAL — GENERAL.

October 1, 1909, *to October* 1, 1910.

Construction of telephone line from Boonville to North Lake	$3,529 84

STATEMENT NO. 5.

Extraordinary repairs and improvements of existing mechanical and other structures and works on and connected with the canals of the State.

(Chapter 290, Laws of 1908.)

Unexpended balance January 1, 1910	$74,230 89

EXPENDITURES OF THE YEAR 1910.

Eastern Division.

Glens Falls Feeder, repairs of			$13,943 55
Locks, repairs of:			
Section 1, Erie:			
Albany weighlock	$453 00		
Lock No. 4	39 00		
Lock No. 11	51 65		
Lock No. 13	51 65		
Lock No. 15	51 65		
		646 95	
Section 2, Erie:			
Lock No. 21	$235 75		
Lock No. 22	191 40		
		427 15	
Section 3, Erie:			
Lock No. 31	$102 50		
Lock No. 32	101 50		
		204 00	
Section 4, Erie:			
Lock No. 35	$104 00		
Lock No. 36	87 00		
Lock No. 41	337 00		
Lock No. 44	397 45		
Lock No. 45	1,205 95		
		2,131 40	
Section 1, Champlain:			
Sloop Lock	$2,379 72		
Lock No. 5	108 20		
		2,487 92	

Section 2, Champlain:			
Glens Falls feeder locks:			
Lock No. 5	$105 18		
Lock No. 9	655 52		
Lock No. 11	198 10		
Lock No. 13	501 97		
		$1,460 77	
Section 3, Champlain:			
Lock No. 21		37 00	
			$7,395 19
Vertical and Slope Walls, repairs of:			
Section 1, Erie:			
Repairing 150 ft. at head of lock No. 18	$39 04		
Through the "Sixteens" and from lock No. 18 to lower Mohawk Aqueduct	315 00		
		354 04	
Section 2, Erie:			
On nine mile level at Culvert No. 20.	$1,199 02		
At a point 300 ft. east of bridge No. 76	2,771 40		
		3,970 42	
Section 1, Champlain:			
Between locks 5 and 6a distance of one-half mile	$213 75		
		213 75	
Section 2, Champlain:			
Between bridges 94 and 95 a distance of 1,700 ft.	$664 48		
South of bridge 13, 250 ft. in the city of Glens Falls	597 10		
		1,261 58	
			5,799 79
Aqueducts, repairs of:			
Section 2, Erie:			
Aqueduct No. 2	$1,086 33		
		$1,086 33	
Section 3, Erie:			
Aqueduct No. 10	$203 25		
		203 25	
			1,289 58
Waste weirs and culverts, repairs of:			
Section 3, Erie: ..			
Culvert west of lock No. 27	$1,460 34		
		$1,460 34	

Section 4, Erie:			
Waste weir No. 10	$173 02		
Culvert No. 73	223 53		
		$396 55	
Section 3, Champlain:			
Eastman's waste weir	$180 00		
		180 00	
			$2,036 89
Bridges, repairs of:			
Section 1, Erie:			
Bridge No. 24	$1,067 16		
		$1,067 16	
Section 3, Erie:			
Bridge No. 84	$38 00		
Bridge No. 88	160 20		
Bridge No. 106	137 60		
Bridge No. 107	136 00		
		471 80	
Section 4, Erie:			
Bridge No. 139	$74 50		
Bridge No. 142	153 63		
Bridge No. 168	135 75		
		363 88	
Section 1, Champlain:			
Bridge No. 15	$299 00		
Bridge No. 33	152 40		
Bridge No. 34	148 60		
		600 00	
Section 2, Champlain:			
Bridge No. 7 Glens Falls feeder	$148 00		
Bridge No. 72	146 75		
		294 75	
			2,797 59
Bulkheads, repairs of:			
Section 1, Erie:			
Through the "Sixteens"	$527 26		
		$527 26	
Section 3, Erie:			
Schoharie creek feeder	$502 10		
		502 10	
			1,029 36
Docking and repairs of:			
Section 1, Erie:			
At head of lock No. 14	$100 15		
At head of lock No. 17	97 47		
		$197 62	
			197 62
			$34,489 57

Middle Division.			
Building stone and gravel scows	$2,108 84		
		$2,108 84	
			$2,108 84
Section 5, Erie:			
Building new scow	$2,188 10		
		$2,188 10	
			2,188 10
Aqueducts, repairs of:			
Section 6, Erie:			
Camillus aqueduct	$3,067 60		
Fayetteville aqueduct	2,923 01		
		$5,990 61	
Section 7, Erie:			
Carpenter brook	$139 50		
		139 50	
			6,130 11
Bridges, repairs of:			
Section 5, Erie:			
City of Utica:			
Broad street	$157 50		
Whitesboro street	343 39		
Schuyler street	128 56		
Washington street	96 28		
John street	3 36		
Genesee street	134 50		
Hotel street	39 60		
No. 24	88 70		
		$991 89	
City of Rome:			
Dockstater avenue	$369 80		
Hutchings street	79 80		
Madison street	77 80		
		527 40	
Canastota:			
Peterboro street	$10 08		
Foot bridge east of culvert 35	36 43		
		46 51	
Section 6, Erie:			
City of Syracuse:			
West Genesee street	$831 82		
State street	29 32		
South Salina street	317 39		
North Salina street	558 87		
Catherine street	247 41		
Willow street	22 71		
1st ward	6 11		
Geddes street	126 47		

West street	22 70		
Clinton street	18 11		
		$2,180 91	
Black River Canal:			
Robert Hill near lock No. 17	$139 43		
Beckwith between locks Nos. 13 and 14	139 43		
Benfield on Forestport feeder	139 77		
		418 63	
			$4,165 34
Weedsport waste weir, repairs of	$183 33		
		$183 33	
			183 33
Locks, repairs of:			
Section 6, Erie:			
Lock No. 47	$140 73		
Lock No. 48	92 71		
Lock No. 49	27 25		
Lock No. 50	490 69		
		$751 38	
Section 7, Erie:			
Lock No. 51	$44 00		
Lock No. 52	177 49		
		$221 49	
Cayuga and Seneca Canal:			
Lock No. 2	$1,520 45		
Lock No. 3	281 58		
Lock No. 4	278 37		
Lock No. 5	1,107 52		
Lock No. 8	54 20		
Lock No. 10	265 10		
		$3,507 22	
Oswego Canal:			
Caughdenoy lock	$2,118 06		
		2,118 06	
			6,598 15
Section 5, Erie:			
Oneida feeder bulkhead, repairs of	$435 84		
		$435 84	
			435 84
			$21,809 71

Western Division.

Vertical and slope walls and bridge abutments, repairs of:		
Section 9, Erie:		
Rebuilding new vertical wall for a distance of 600 feet east of Lyell avenue bridge, Rochester	$1,674 75	
		$1,674 75

Section 10, Erie:			
Relaying 200 feet of vertical wall at Hindsburg	$208 12		
Cleaning out and replanking horse escape at bridge No. 128	40 33		
		$248 45	
Section 11, Erie:			
Rebuilding west abutment of Lockslip bridge, Tonawanda	$1,343 78		
At various points along the front angle of the canal between Rhode Island and Albany streets, Buffalo	1,822 20		
Between Main street bridge and Seymour street, Tonawanda	28 50		
		3,194 48	
			$5,117 68
Sheet piling and docking:			
Section 9, Erie:			
Sheet piling for about 1400 feet west of Donnelly's bridge No. 59	$2,847 79		
		$2,847 79	
Section 10, Erie:			
Repairs of docking on the south side of State yard and retaining wall under the State building at Lockport	$305 46		
		305 46	
			3,153 25
Locks, repairs of:			
Section 8, Erie:			
Lock No. 53	$143 40		
Lock No. 54	218 21		
Lock No. 55	718 21		
Lock No. 58	595 46		
Lock No. 59	116 43		
Lock No. 60	199 65		
Lock No. 61	943 39		
		$2,934 75	
Section 10, Erie:			
Combined locks at Lockport	$257 48		
		257 48	
			3,192 23
Culverts, repairs of:			
Section 8, Erie:			
Culvert No. 12	$631 92		
Culvert No. 23½	263 97		
		$895 89	
Section 9, Erie:			
Culvert No. 28	$840 93		
		840 93	

Section 10, Erie:			
Culvert No. 72	$444 82		
Culvert No. 78	38 50		
Culvert No. 85	95 25		
Culvert No. 98	740 27		
		$1,318 84	
			$3,055 66
Equipment:			
Division:			
Pump boat	$70 75		
Derrick boat	648 25		
Piston pile driver	500 00		
Hoisting engine	1,219 80		
		$2,438 80	
			2,438 80
Boats and shop, repairs of:			
Section 11, Erie:			
Repairs to scow "Tonawanda"	$221 00		
Repairs to dredge and scows	203 25		
		$424 25	
			424 25
Bridges, repairs of:			
Section 8, Erie:			
Bridge No. 42	$464 49		
		$464 49	
			464 49
Waste weirs, repairs of:			
Section 10, Erie:			
Building houses over waste weirs 15 and 16	$85 25		
		$85 25	
			85 25
			$17,931 61

EXPENDITURES FROM THE EXTRAORDINARY REPAIR FUND BY DIVISIONS.

(Chapter 290, Laws of 1908.)

Eastern	$34,489 57
Middle	21,809 71
Western	17,931 61
	$74,230 89

STATEMENT No. 6.

Extraordinary Repairs and Improvements of Existing Mechanical and Other Structures and Works on and connected with the Canals of the State.

(Chapter 437, Laws of 1909.)

Appropriation available January 1, 1910	$125,000 00

EXPENDITURES OF THE YEAR 1910.

Eastern Division.

Locks, repairs of:			
Section 1, Erie:			
Lock No. 1	$88 05		
		$88 05	
Section 1, Champlain:			
Lock No. 5	$41 60		
		41 60	
			$129 65
Vertical and slope walls, repairs of:			
Section 1, Erie:			
Repairing 150 feet at head of lock 18	$58 50		
Through the "Sixteens" and from lock 18 to Lower Mohawk aqueduct.	594 50		
		$653 00	
Section 2, Erie:			
At a point 300 feet east of bridge 76	$29 60		
		29 60	
Section 1, Champlain:			
Between locks 5 and 6, a distance of one-half mile	$507 05		
		507 05	
			1,189 65
Aqueducts, repairs of:			
Section 1, Erie:			
Lower Mohawk aqueduct	$245 45		
		$245 45	
Section 2, Erie:			
Upper Mohawk aqueduct	$28 95		
		28 95	
Section 3, Erie:			
Aqueduct No. 10	$43 60		
		43 60	
			318 00
Waste weirs and culverts, repairs of:			
Section 3, Erie:			
Culvert west of lock 27	$524 00		
Culvert No. 38	36 80		
		$560 80	
Section 2, Champlain:			
Waste weir near lock 15	$97 25		
		97 25	
			658 05
Bulkheads, repairs of:			
Section 1, Erie:			
From Lock No. 1 to 18	$117 40		
Section 3, Erie:			
Schoharie creek feeder	$64 90		
		64 90	
			182 30

Mohawk river flood damages, repairs of:			
Section 1, Erie:			
Repairs to Lower Mohawk aqueduct by putting in bracer, needle beams, etc.	$453 24		
		$453 24	
Section 2, Erie:			
Preparation for and repairs of Rexford Flats feeder gates	$943 01		
Raising towpath and repairing docking and slope walls between bridge No. 63 and lock No. 23	1,161 61		
Rebuilding river wall and towpath east of lock No. 21	1,446 16		
Rebuilding slope wall and towpath between Vischer's Ferry and Crescent.	9,687 65		
Repairing towpath and walls east of lock No. 25	479 00		
Repairing towpath and relaying riprap east of bridge No. 67	1,019 20		
Repairing towpath and walls between Flint Hill and lock No. 27	138 50		
		14,875 13	
Section 3, Erie:			
Repairing prism of canal and towpath wall west of lock No. 27	$497 30		
Repairing towpath between Sprakers and Fort Plain	122 50		
Repairing prism of canal at Big Nose.	525 13		
		1,144 93	
Section 4, Erie:			
Recovering timber washed and scattered by the flood at Frankfort	$43 75		
Cleaning out ice and repairing break in Moyer creek	504 93		
Repairing canal bank 1000 feet west of bridge No. 133	150 25		
Repairing bank and cleaning out culvert No. 69, 200 feet west of bridge No. 133	464 50		
		1,163 43	
			$17,636 73
Section 4, Erie:			
Repairs of break west of lock No. 43.	$9,877 71		
		$9,877 71	
			9,877

Strengthening towpath and berme banks:			
Section 2, Erie:			
Between lock No. 24 and bridge No. 65	$2,256 90		
From Fort Hunter to west of lock No. 24	2,112 45		
West of aqueduct No. 3	1,050 50		
West of aqueduct No. 4	1,088 02		
West of bridge No. 65	377 00		
West of bridge No. 74	180 00		
		$7,064 87	
Section 3, Erie:			
West of bridge No. 83	$135 30		
West of bridge No. 95	568 90		
		704 20	
Section 4, Erie:			
Between bridges Nos. 131 and 132	$352 25		
Between bridges Nos. 137 and 138	1,100 25		
		1,452 50	
			$9,221 57
Cutting weeds, brush and eel grass:			
Section 1, Erie:			
From Albany to Lower Mohawk aqueduct	$96 00		
		$96 00	
Section 2, Erie:			
Between bridge No. 64 and lock No. 26	$237 75		
		237 75	
Section 3, Erie:			
Between locks Nos. 28 and 29	$3 20		
At Big Nose	9 60		
Schoharie creek feeder	1 60		
		14 40	
Section 2, Champlain:			
On Glens Falls feeder	$207 00		
		207 00	
			555 15
Bridge approaches, repairs of:			
Section 1, Erie:			
Resurfacing with gravel approaches to bridges on section	$584 75		
		$584 75	
Section 3, Erie:			
Resurfacing with gravel approaches to bridges on section	$233 90		
		233 90	
Section 4, Erie:			
Resurfacing with gravel approaches to bridges on section	$189 00		
		189 00	
			1,007 65

Painting:			
Section 1, Erie:			
Locks and bridges on section........	$726 80		
		$726 80	
Section 2, Erie:			
Locks and bridges on section........	$152 00		
		152 00	
Section 3, Erie:			
Locks and bridges on section........	$326 65		
		326 65	
Section 4, Erie:			
Locks and bridges on section	$605 25		
		605 25	
Section 1, Champlain:			
Locks and bridges on section........	$667 50		
		667 50	
Section 2, Champlain:			
Locks and bridges on section........	$259 00		
		259 00	
Section 3, Champlain:			
Locks and bridges on section........	$70 00		
		70 00	
			$2,807 20
Docking, scraping and graveling:			
Section 1, Erie:			
Between lock No. 3 and Lower Mohawk aqueduct	$1,348 14		
		$1,348 14	
Section 2, Erie:			
From Schenectady to west end of Lower Mohawk aqueduct.........	$73 20		
West of aqueduct No. 1.............	426 00		
Between lock No. 24 and one-quarter mile east of bridge No. 65........	600 00		
Between bridge No. 44 and lock No. 21.	321 00		
1,500 feet west from Lower Mohawk aqueduct	142 50		
General on section..................	184 21		
		1,746 91	
Section 3, Erie:			
Between bridge No. 110 and lock No. 33.	$306 50		
East of bridge No. 110..............	220 50		
Between acqueducts Nos. 6 and 8....	794 30		
West of bridge No. 94...............	8 40		
		1,329 70	
Section 4, Erie:			
Between locks Nos. 36 and 39........	$544 75		
West of lock No. 39..................	485 50		
		1,030 25	

Section 1, Champlain:			
Waterford side cut..................	$190 00		
Between bridge No. 62 and aqueduct No. 1...........................	58 00		
Between Wilbur's Basin and Coville..	778 00		
For 6½ miles at different points on section	550 00		
General on section..................	194 40		
		$1,770 40	
Section 2, Champlain:			
Between bridges Nos. 5 and 7, Glens Falls feeder	$704 50		
Between bridges Nos. 81 and 82......	772 00		
Between bridges Nos. 95 and 97......	474 00		
Between bridges Nos. 71 and 72......	855 50		
North of bridge No. 78.............	165 50		
200 feet north and 300 feet south of O'Brien's spillway	58 50		
		3,030 00	
Section 3, Champlain:			
On Twelve Mile level...............	$719 84		
		719 84	
			10,975 24
Dams, repairs of:			
Section 3, Erie:			
Schoharie creek dam.................	$464 15		
		$464 15	
Section 1, Champlain:			
Troy dam	$304 24		
		304 24	
			768 39
Aqueducts and culverts, cleaning out and under:			
Section 3, Erie:			
Four arch culvert at Amsterdam and creek passing under it............	$350 50		
		$350 50	
Section 4, Erie:			
Culvert No. 70.....................	$124 10		
		124 10	
			474 60
Section 2, Champlain:			
Repairing slide in the high towpath bank north of bridge No. 94.....	$887 25		
		$887 25	
			887 25
			$56,689 14

Middle Division.

Building stone and gravel scows......	$356 33		
		$356 33	
Section 5, Erie:			
Building new scow................	$153 84		
		153 84	
Bridges, repairs of:			
Section 5, Erie:			
City of Utica:			
Whitesboro street	$8 02		
Schuyler street	14 31		
Washington street	44 28		
John street	217 10		
Genesee street	265 11		
Hotel street	52 00		
No. 24	1 65		
		602 47	
City of Rome:			
Dockstader avenue	$9 50		
Hutchings street	23 70		
		33 20	
Canastota:			
Peterboro street	$8 29		
Foot bridge east of culvert No. 45....	1,002 08		
		1,010 37	
Section 6, Erie:			
City of Syracuse:			
West Genesee street................	$29 29		
State street	75 03		
South Salina street................	58 63		
North Salina street................	49 30		
Catherine street	53 08		
Willow street	2 95		
First ward	2 94		
Geddes street	51 23		
West street	10 26		
Clinton street	4 87		
		337 58	
Black River canal:			
Eberts bridge — Alder creek reservoir.	$10 00		
		10 00	
			$1,993 62
Aqueducts and culverts, repairs of:			
Section 6, Erie:			
Fayetteville aqueduct	$67 80		
Canasaraga culvert and Chittenango aqueduct	270 65		
		$338 45	
			338 45

Painting:			
Section 5, Erie:			
Locks and bridges on section..........	$1,805 70		
		$1,805 70	
Section 6, Erie:			
Locks and bridges on section........	$1,489 75		
		1,489 75	
Section 7, Erie:			
Locks and bridges on section.........	$507 25		
		507 25	
Cayuga and Seneca canal:			
Locks and bridges on canal	$542 40		
		542 40	
			$4,345 10
Berme bank, repairs of:			
Section 5, Erie:			
Between Rome and Durhamville......	$1,271 44		
		$1,271 44	
Section 6, Erie:			
Between Fayetteville aqueduct and Poole's Brook waste weir..........	$1,322 49		
		1,322 49	
			2,593 93
Oswego canal:			
Oak Orchard dam, repairs of........	$505 75		
		505 75	
			505 75
Madison county reservoirs, repairs of:			
Section 5, Erie:			
Bradley brook	$387 55		
Kingsley brook	139 05		
Eaton brook	182 80		
Chenango feeder	9 15		
Madison feeder	280 35		
		$998 90	
			998 90
Ditching:			
Cayuga and Seneca canal:			
Montezuma level	$254 00		
		$254 00	
			254 00
			$23,158 91

Western Division.

Vertical and slope walls, repairs of:			
Section 9, Erie:			
Rebuilding new vertical wall for a distance of 600 feet east of Lyell Avenue bridge, Rochester............	$3,671 73		
		$3,671 73	

Locks, repairs of:			
Section 6, Erie:			
Lock No. 47	$125 09		
Lock No. 48	84 15		
Lock No. 49	33 78		
Lock No. 50	33 80		
		$276 82	
Oswego canal:			
Caughdenoy	$1,822 53		
		1,822 53	
Cayuga and Seneca canal:			
Lock No. 2	$18 11		
Lock No. 3	4 37		
Lock No. 4	18 62		
Lock No. 5	185 02		
Lock No. 8	13 87		
Lock No. 10	21 92		
		261 91	
			$2,361 26
Bulkhead, repairs of:			
Section 5, Erie:			
Oneida feeder	$1 85		
		$1 85	
			1 85
Feeders and spillway, repairs of:			
Section 5, Erie:			
Oneida feeder	$728 65		
Chenango feeder spillway	425 89		
		$1,154 54	
			1,154 54
Towpath, repairs of:			
Section 6, Erie:			
Just east of Hedson's landing for a distance of 1,500 feet	$4,001 53		
Between Canastota and Syracuse	839 50		
		$4,841 03	
Section 5, Erie:			
A distance of 8 miles where needed	$1,076 91		
		1,076 91	
Section 7, Erie:			
Between Camillus and Memphis, a distance of 4 miles	$28 02		
		28 02	
Cayuga and Seneca canal:			
Between Seneca Falls and Mud lock and between Waterloo and Guard lock	$1,700 58		
From Montezuma to Cayuga	454 80		
		2,155 38	
			8,101 34

Section 10, Erie:			
Back filling vertical wall for 200 feet at Hindsburg	$40 25		
Strengthening bank at spillway of old canal at Holley	166 25		
Rebuilding 300 feet of vertical wall and repairing horse escape east of combined locks	375 62		
		$582 12	
Section 11, Erie:			
Completing building west abutment of Lock Slip bridge, Tonawanda and rebuilding 19 feet of retaining wall adjoining the abutment	$1,436 63		
Removing old timber dock and excavating for new timber docking for slope wall west of State ditch, Tonawanda	723 51		
Rebuilding wing wall on west side of abutment, Bouck street bridge, Tonawanda	684 60		
Rebuilding 300 feet of vertical wall between Main and Seymour streets bridges, Tonawanda	1,049 90		
At various places along the front angle of the canal between Rhode Island and Albany streets, Buffalo.	3,338 87		
Between Erie and Charles streets, Buffalo	112 87		
Between Porter avenue and Jersey street, Buffalo	230 00		
Between Lake street and mouth of Commercial slip	1,053 51		
At State yard between Dry Dock and Porter avenue	173 52		
		8,803 41	
			$13,057 26
Snubbing posts, setting:			
Between Commercial slip and Mechanic street, Buffalo	$171 42		
		$171 42	
			171 42
Sheet piling and docking:			
Section 9, Erie:			
Sheet piling for about 1,400 feet west of Donnelly's bridge, No. 59	$1,143 37		
Plank sheeting a high embankment at Bushnell's basin and vicinity of culvert No. 29	614 98		
		$1,758 35	

Section 10, Erie:			
Rebuilding 80 feet of timber pier berme side of canal southeast of combined locks between State race and canal	$1,073 08		
400 feet sheet piling berme side of canal in rear of sub-station of trolley line, Albion	587 75		
		$1,660 83	
Section 9, Erie:			
100 feet triple lap sheet piling opposite Colby street, Brighton	$178 85		
		178 85	
			$3,598 03
Locks, repairs of:			
Section 8, Erie:			
Lock No. 56	$169 59		
Lock No. 58	192 11		
Lock No. 59	169 62		
		$531 32	
Section 9, Erie:			
Lock No. 62	$13 75		
Lock No. 63	242 07		
Lock No. 64	242 07		
Lock No. 65	242 05		
Lock No. 66	242 07		
		982 01	
Section 10, Erie:			
Combined locks at Lockport	$211 39		
		211 39	
			1,724 72
Culverts, repairs of:			
Section 8, Erie:			
Culvert No. 12	$471 75		
Culvert No. 22	88 13		
Culvert No. 23½	382 50		
		$942 38	
Section 9, Erie:			
Culvert No. 28	$227 90		
		227 90	
Section 10, Erie:			
Culvert No. 69	$634 77		
Culvert No. 98	504 56		
		1,139 33	
			2,309 61
Equipment:			
Division:			
Pump boat	$3,928 31		
Derrick boat	4,049 77		

Tug "Hardy"	$404 77		
Six flat bottom boats	91 00		
		$8,473 85	
			$8,473 85
Bridges, repairs of:			
Section 8, Erie:			
Bridge No. 42	$321 50		
		$321 50	
			321 50
Waste weirs, repairs of:			
Section 10, Erie:			
Building houses over waste weirs 15 and 16	$55 16		
		$55 16	
			55 16
Towpath, repairs of:			
Section 8, Erie:			
Through section where needed	$2,486 66		
		$2,486 66	
Section 9, Erie:			
Through section where needed	$2,126 56		
		2,126 56	
Section 10, Erie:			
Through section where needed	$2,126 56		
		753 15	
			5,366 37
Ditching:			
Section 9, Erie:			
Between Culver road and Winton road bridge	$419 44		
		$419 44	
			419 44
Boats and shop, repairs of:			
Section 11, Erie:			
Dredge	$451 91		
Tug "Queen City"	293 37		
Scow "Buffalo"	196 50		
Building fence at State yard, Tonawanda	41 00		
Shingling carpenter shop, Buffalo	80 00		
		$1,062 78	
			1,062 78
Spillway, repairs of:			
Section 11, Erie:			
At Tonawanda	$628 06		
		$628 06	
			628 06

Docking:			
At Tonawanda	$535 53		
		$535 53	
			$535 53
Painting:			
Section 8, Erie:			
Bridges on section	$811 15		
		$811 15	
Section 9, Erie:			
Bridges on section	$2,864 03		
State buildings at weighlock	148 75		
		3,012 78	
Section 10, Erie:			
Bridges on section	$221 80		
		221 80	
Section 11, Erie:			
Bridges on section	$2,605 19		
		2,605 19	
			6,650 92
Storehouses, construction of:			
Section 10, Erie:			
At Albion	$321 74		
		$321 74	
Section 11, Erie:			
At State Yard, Buffalo	$455 56		
		455 56	
			777 30
			$45,151 95

EXPENDITURES FROM THE EXTRAORDINARY REPAIR FUND BY DIVISIONS.

(Chapter 437, Laws of 1909.)

Eastern	$56,689 14	
Middle	23,158 91	
Western	45,151 95	
		$125,000 00

STATEMENT No. 7.

Extraordinary Repairs and Improvements of Existing Mechanical and Other Structures on and Connected with the Canals of the State.

(Chapter 533, Laws of 1910.)

Appropriation	$125,000 00

EXPENDITURES OF THE YEAR 1910.

Eastern Division.

Locks, repairs of:			
Section 1, Erie.			
Lock No. 3	$75 74		
Lock No. 4	75 73		
		$151 47	
Section 2, Erie.			
Lock No. 25	$125 20		
		125 20	
Section 3 Erie.			
Lock No. 29	$94 50		
Lock No. 30	47 75		
Lock No. 32	72 70		
Lock No. 34	79 50		
		294 45	
Section 4, Erie.			
Lock No. 37	$31 25		
Lock No. 38	31 25		
Lock No. 39	31 25		
Lock No. 41	67 00		
Lock No. 44	31 25		
Lock No. 45	31 25		
		223 25	
Section 1, Champlain:			
Waterford weighlock	$108 20		
Lock No. 6	94 00		
		202 20	
Section 2, Champlain:			
Glens Falls feeder locks:			
Lock No. 8	$530 00		
Lock No. 13	98 00		
Lock No. 4	44 25		
Lock No. 8	110 50		
		782 75	
			$1,779 32
Vertical and slope walls, repairs of:			
Section 1, Erie:			
Between locks Nos. 7 and 8	$1,575 97		
		$1,575 97	
Section 2, Erie:			
Between bridge No. 57 and N. Y. C. & H. R. R. bridge, Schenectady	$1,564 91		
		1,564 91	
Section 2, Champlain:			
North of bridge, No. 94	$608 75		
		608 75	
			3,749 63

Aqueducts, repairs of:			
Section 1, Erie:			
Lower Mohawk aqueduct..........	$77 63		
		$77 63	
			$77 63
Waste weirs and culverts, repairs of:			
Section 2, Erie:			
Waste weir No. 7 just west of bridge No. 62, Schenectady	$525 25		
		$525 25	
Section 3, Champlain:			
Bailey's waste weir on 12-mile level...	$250 00		
		250 00	
			775 25
Bridge approaches, repairs of:			
Section 3, Erie:			
Where required on section..........	$8 00		
		$8 00	
			8 00
Docking, scraping and graveling:			
Section 4, Erie:			
Between locks Nos. 36 and 39........	$183 25		
		$183 25	
			183 25
Dams, repairs of:			
Section 3, Erie:			
Schoharie Creek dam...............	$91 50		
		$91 50	
			91 50
Break west of lock No. 43, repairs of:			
Section 4, Erie....................	$2,414 28		
		$2,414 28	
			2,414 28
Bridges, repairs of:			
Section 2, Erie:			
Bridge No. 55.....................	$99 50		
		$99 50	
Section 3, Erie:			
Bridge No. 96.....................	$172 10		
		172 10	
Section 4, Erie:			
Bridge No. 143....................	$101 25		
		101 25	
			372 85
			$9,451 71

Middle Division.

Bridges, repairs of:			
Section 5, Erie:			
City of Utica:			
Schuyler street	$118 50		
Construction of 2 highway bridges for emergency	47 50		
		$166 00	
Section 6, Erie:			
City of Syracuse:			
West Genesee street	$120 00		
		120 00	
Section 7, Erie:			
Highway bridge No. 120	$65 00		
Change bridge, Montezuma	60 50		
		125 50	
Section 5, Erie:			
Foot bridge east of culvert No. 35	$750 19		
		750 19	
Black River canal:			
Eberts bridge — Alder Creek reservoir	$1,742 70		
		1,742 70	
			$2,904 39
Towpath, repairs of:			
Section 5, Erie:			
Where needed on section	$1,334 24		
		$1,334 24	
Section 6, Erie:			
Just east of Hedson's Landing for a distance of 1,500 feet	$1,856 85		
		1,856 85	
Cayuga and Seneca canal:			
Between Seneca Falls and Mud lock and between Waterloo and Guard lock	$1,288 55		
		1,288 55	
			4,479 64
Dredge fleet, repairs of:			
Middle division:			
Tug "Thomas Wheeler" and dredge	$97 50		
		$97 50	
			97 50
Machine shop:			
Enlarging	$859 30		
		$859 30	
			859 30

Madison county reservoirs, repairs of:			
Section 5, Erie:			
Eaton brook	$30 60		
Kingsley brook	49 36		
		$79 96	
			$79 96
Locks, repairs of:			
Section 6, Erie:			
Lock No. 47	$424 50		
		$424 50	
			424 50
Spillway, repairs of:			
Section 5, Erie:			
Oneida creek	$466 15		
		$466 15	
			466 15
Reservoirs, repairs of:			
Black river canal:			
Woodhull	$499 09		
		$499 09	
			499 09
Berme bank, repairs of:			
Section 5, Erie:			
Between Rome and Durhamville	$745 00		
		$745 00	
Section 6, Erie:			
Between Fayetteville aqueduct and Poole's Brook waste weir	$1,613 02		
		1,613 02	
			2,358 02
Ditching:			
Cayuga and Seneca canal:			
Montezuma level	$620 05		
		$620 05	
			620 05
Painting:			
Section 5, Erie:			
Locks and bridges on section	$755 88		
		$755 88	
Section 6, Erie:			
Locks and bridges on section	$546 50		
		546 50	
Cayuga and Seneca canal:			
Locks and bridges on canal	$412 15		
		412 15	
			1,714 53
			$14,503 13

Western Division.

Vertical and slope walls, repairs of:			
Section 11, Erie:			
Between Lake street and mouth of Commercial slip, Buffalo..........	$829 49		
Between Commercial and Erie streets, Buffalo	93 20		
Between Potomac avenue and Bridge street, Buffalo	132 90		
		$1,047 59	
			$1,047 59
Towpath, repairs of:			
Section 9, Erie:			
Between bridges Nos. 45 and 47......	$557 35		
		$557 35	
			557 35
Painting:			
Section 8, Erie:			
Locks and bridges on section.........	$134 70		
		$134 70	
Section 9, Erie:			
Locks and bridges on section.........	$248 85		
		248 85	
Section 10, Erie:			
Locks and bridges on section.........	$268 79		
		268 79	
Section 11, Erie:			
Locks and bridges on section.........	$17 20		
		17 20	
			669 54
Locks, repairs of:			
Section 8, Erie:			
Lock No. 54.........................	$477 40		
Lock No. 56.........................	345 75		
Lock No. 57.........................	188 25		
		$1,011 40	
Section 9, Erie:			
Lock No. 62.........................	$689 91		
Lock No. 63.........................	241 35		
Lock No. 64.........................	608 35		
Lock No. 65.........................	970 03		
Lock No. 66.........................	516 39		
		3,026 03	
			4,037 43
Culverts, repairs of:			
Section 9, Erie:			
Culvert No. 36 (Donnelly's).......	$687 79		
		$687 79	
			687 79
			$6,999 70

EXPENDITURES FROM THE EXTRAORDINARY REPAIR FUND BY DIVISIONS.

(Chapter 533, Laws of 1910.)

Eastern	$9,451 71
Middle	14,503 13
Western	6,999 70
	$30,954 54

SUMMARY OF AVAILABLE FUNDS AND EXPENDITURES FOR THE YEAR 1910 FROM THE EXTRAORDINARY REPAIR FUNDS.

Funds.

(Chapter 290, Laws of 1908.)

Unexpended balance January 1, 1910	$74,230 89

(Chapter 437, Laws of 1909.)

Appropriation	$125,000 00

(Chapter 533, Laws of 1910.)

Appropriation	$125,000 00
	$324,230 89

EXPENDITURES BY SECTIONS AND DIVISIONS.

Eastern Division.

Section 1, Erie	$8,910 93	
Section 2, Erie	31,933 97	
Section 3, Erie	8,645 27	
Section 4, Erie	20,256 10	
Section 1, Champlain	6,794 66	
Section 2, Champlain	22,832 65	
Section 3, Champlain	1,256 84	
		$100,630 42

Middle Division.

Division	$3,421 97	
Section 5, Erie	16,596 38	
Section 6, Erie	22,089 89	
Section 7, Erie	1,205 09	
Oswego	4,446 34	
Cayuga and Seneca	9,041 66	
Black River	2,670 42	
		59,471 75

Western Division.

Division	$10,912 65	
Section 8, Erie	10,534 24	

Section 9, Erie	$22,261 11		
Section 10, Erie	7,429 79		
Section 11, Erie	18,945 47		
		$70,083 26	
			$230,185 43
Available balance January 1, 1911			$94,045 46

STATEMENT No. 8.

Statement of Payments made by the Superintendent of Public Works under Legislative Acts, for the purposes therein stated, from January 1, 1910, *to January* 1, 1911.

For the compensation of gate tenders of the State dams upon the Beaver and Moose rivers. (Chapters 432 and 512, Laws of 1909 and 1910.):		
Gate tenders	$1,191 66	
		$1,191 66
For the improvement of the Black River canal and the repairs and reconstruction of structures thereof between its junction with the Erie canal in the city of Rome and the northerly boundary line in the village of Boonville. (Chapter 196. Laws of 1909.):		
By division superintendent	$33,207 82	
		33,207 82
For the construction of a bridge over the Erie canal at Georgia street in the city of Buffalo. (Chapter 452, Laws of 1909.):		
Lupfer & Remick, contractor	$15,309 00	
Advertising	52 00	
		15,361 00
Improvement of the Cayuga inlet in the city of Ithaca, and the repair and reconstruction of the bridges over the same. (Chapters 267 and 356, Laws of 1908 and 1910.):		
By division superintendent	$8,491 08	
Purchase of land	18,256 84	
		26,747 92
For the services and expenses of agent employed in defense of claims against the State on account of the canals. (Chapters 433 and 513, Laws of 1909 and 1910.):		
Matthew A. Heeran	$13,345 98	
		13,345 98

For the purpose of paying the expenses incurred by the Superintendent of Public Works in investigating and reporting as to the acquisition of toll bridges across the Delaware river between this State and the State of Pennsylvania. (Chapters 275, 556 and 187, Laws of 1905, 1907 and 1909.):		
By the Superintendent	$144 70	
		$144 70
For the operation, maintenance and repairs of the drawbridge, known as Drake's drawbridge, spanning Wappinger creek in the village of New Hamburg, Dutchess county. (Chapters 432 and 433, Laws of 1909, and Chapter 512, Laws of 1910.):		
Bridge tender	$433 33	
Expenses	29 65	
		462 98
For the maintenance and repairs of three highway bridges over the Eighteen Mile creek in the towns of Lockport and Newfane, in the county of Niagara. (Chapter 513, Laws of 1910.):		
By division superintendent	$242 07	
		242 07
For removing, breaking up and destroying the ice gorge or blockade in the West Canada creek at Herkimer. (Chapter 513, Laws of 1910.):		
By the superintendent	$1,064 64	
		1,064 64
For removing, opening up and destroying the ice gorge or blockade in the Hudson river. (Chapter 513, Laws of 1910.):		
By the superintendent	$5,685 81	
		5,685 81
For the salaries and expenses of inspectors of steam vessels. (Chapters 432 and 512, Laws of 1909 and 1910.):		
Inspectors, salaries of	$6,500 00	
Traveling expenses	1,270 20	
Stationery	11 40	
		7,781 60

For the erection of a lighthouse at the outlet to Lake Keuka, and for the repairs of the pier in such outlet near the village of Penn Yan. (Chapters 483, Laws of 1906, and Chapters 203 and 266, Laws of 1908.):		
By the superintendent	$19 50	
		$19 50
For installing the wires and other equipment requisite for lighting by electricity the lighthouse at the entrance of the channel on Lake Keuka at Penn Yan and for paying the cost of electricity for lighting and maintaining such lighthouse for the period of one year and for paying the storage on the lighthouse for 19½ months prior to the erection. (Chapter 513, Laws of 1910.):		
Municipal board, Penn Yan, for wiring	$382 00	
Inspection	77 64	
		459 64
For the replanking of the bridge over the Keuka Lake outlet at Liberty street, Penn Yan, and for other necessary repairs to the superstructure and foundations of said bridge. (Chapter 513, Laws of 1910.):		
By division superintendent..........	$1,172 55	
		1,172 55
For the compensation of the tender and for the maintenance and operation of the drawbridge over Minisceongo creek, Rockland county. (Chapters 432 and 433, Laws of 1909, and Chapter 512, Laws of 1910.):		
Tender	$650 00	
Expenses	23 58	
		673 58
For restoring the embankment of Moyer creek destroyed by flood and for the cleaning out of the bed of the creek in the village of Frankfort. (Chapter 513, Laws of 1910.):		
By division superintendent..........	$3,533 57	
		3,533 57

For reimbursing the city of North Tonawanda for the cost of paving such portion of Vandervoort street as lies within the blue line of the State ditch fronting said street. (Chapter 513, Laws of 1910.):			
By the superintendent	$488 97		
			$488 97
For the purpose of making necessary repairs to the bridge over Otsquago creek in the village of Fort Plain, Montgomery county. (Chapter 513, Laws of 1910.):			
By division superintendent	$802 01		
		802 01	
For the improvement of the Oriskany creek feeder in the town of Kirkland, Oneida county, by the construction of retaining wall and repair of the existing retaining wall. (Chapter 518, Laws of 1910.):			
By division superintendent	$2,008 00		
		2,008 00	
For construction of a stone or concrete bridge over the State feeder at Cedar street in the city of Oneida. (Chapter 519, Laws of 1910.):			
By division superintendent	$4,266 15		
		4,266 15	
Construction of a lift bridge over the Erie canal at Allen street in the city of Rochester. (Chapter 513, Laws of 1910.):			
Wm. T. McKibben Co., contractor	$5,005 48		
Inspection	135 50		
		5,140 98	
For reimbursing G. T. Fries, of Saranac lake as chairman of the Saranac lake lock repairs committee for moneys expended in repairing the lower dock in Saranac river. (Chapters 291 and 356, Laws of 1908 and 1910.):			
By the superintendent	$124 61		
		124 61	
For the repair and maintenance of the two State dams and the locks therein situated on State land on the Saranac river between Middle			

Saranac lake and Oseetah lake and making the waters there navigable and safe. (Chapter 513, Laws of 1910.):			
By division superintendent..........	$5,476 96		
			$5,476 96
For the construction of a lift or hoist bridge over the Erie canal at Franklin street in the city of Syracuse. (Chapters 453 and 527, Laws of 1909 and 1910.):			
Advertising	$42 00		
		42 00	
For reimbursing F. C. Stevens for moneys expended by him in payment for "State Inspection Boat" and for equipment and furnishings of same. (Chapter 513, Laws of 1910.):			
By the superintendent..............	$23,082 57		
		23,082 57	
For rebuilding and extending the wall along Steele creek north of the Erie canal in the village of Ilion. (Chapter 513, Laws of 1910.):			
By division superintendent..........	$3,695 12		
		3,695 12	
For the purpose of removing obstruction, cleaning out, widening and deepening the State ditch in the town of Tonawanda and making such alterations and improvements as may be necessary to prevent the overflow thereof. (Chapter 513, Laws of 1910.):			
By division superintendent..........	$2,667 59		
		2,667 59	
For the construction of a lift or hoist bridge over the Erie canal on Seneca street, in the city of Utica. (Chapter 454, Laws of 1909.):			
N. D. Peters Company, contractor....	$18,596 47		
Inspection	1,327 16		
		19,923 63	
For the president and trustees of the village of Waterford in payment of the State's share of the assessment for the brick pavement, granite curb and concrete sidewalk			

fronting on the lands of the State on Third street in said village of Waterford. (Chapter 513, Laws of 1910.):			
By the superintendent	$224 72		
		$224 72	
			$179,038 33

STATEMENT No. 9.

Statement of Payments made by the Superintendent of Public Works from January 1, 1910, to January 1, 1911, under the "Barge Canal Act."

(Chapter 147, Laws of 1903 and Amendatory Acts thereto.)

Contract No. 1:		
Empire Engineering Corporation, contractor	$6,408 00	
		$6,408 00
Contract No. 2-E:		
Holler & Shepard, contractor	$3,051 00	
Union Trust Company of Rochester, Attorney-in-Fact for Holler & Shepard, contractor	149,499 00	
Extra or unspecified work (see Canal Board Proceedings, October 25, 1910)	226 22	
Advertising	366 80	
		153,143 02
Contract No. 4:		
Empire Engineering Corporation, contractor	$14,409 00	
Extra or unspecified work, (see Canal Board Proceedings, January 6, February 15 and October 25, 1910)	11,045 82	
		25,454 82
Contract No. 4-B:		
Advertising	$26 25	
		26 25
Contract No. 6:		
Marie H. Maselli, executrix, Estate of F. A. Maselli, contractor	$98,991 00	
Recording appropriations of land	4 00	
		98,995 00
Contract No. 7:		
Groton Bridge Co., contractor	$9,757 19	
Extra or unspecified work, (see Canal Board Proceedings, April 27, 1910)	3,143 17	
		12,900 36
Contract No. 8:		
Pittsburg-Eastern Co., contractor	$145,305 00	
Extra or unspecified work, (see Canal Board Proceedings, December 23, 1909, and March 23, 1910)	355 74	
		145,660 74

Contract No. 9:		
Thos. Crimmins Contracting Co., contractor....	$252,288 00	
Extra or unspecified work, (see Canal Board Proceedings, December 23, 1909)..............	2,859 38	
Recording appropriations of land.............	53 75	
		$255,201 13
Contract No. 10:		
Chas. McDermott & Clifford Lewis, Jr., receivers of McDermott Contracting Co., contractor....	$206,271 00	
Recording appropriations of land.............	1 00	
		206,272 00
Contract No. 11:		
The National Commercial Bank, Albany, Attorney-in-Fact for The Fort Orange Construction Co., contractor......................	232,515 00	
Extra or unspecified work, (see Canal Board Proceedings, February 15, October 25, and November 16, 1910)............................	2,323 27	
		234,838 27
Contract No. 12:		
Stewart-Kerbaugh-Shanley Co., contractor......	$212,166 00	
Jas. Stewart & Co., contractor................	178,551 00	
Recording appropriations of land.............	2 50	
		390,719 50
Contract No. 13:		
Penn. Bridge Co., contractor.................	$14,022 00	
		14,022 00
Contract No. 14:		
Acme Engineering & Contracting Co., contractor.	$414,351 00	
Extra or unspecified work, (see Canal Board Proceeding, December 23, 1909, February 15, March 23, June 25 and December 29, 1910)..	16,347 11	
Recording appropriations of land.............	157 80	
		430,855 91
Contract No. 15:		
The National Commercial Bank, Albany, Attorney-in-Fact for The Atlantic, Gulf and Pacific Co., contractor.....................	$146,106 00	
		146,106 00
Contract No. 17:		
Alexander Murdock, contractor...............	$152,460 00	
Extra or unspecified work, (see Canal Board Proceedings, March 23, and October 25, 1910)....	754 62	
		153,214 62
Contract No. 18:		
O'Brien & Hoolihan Contracting Co., contractor.	$29,916 00	
Extra or unspecified work, (see Canal Board Proceedings, November 23, 1909).............	6,705 00	
Kelley Brothers Contracting Co., contractor....	70,880 85	
Recording appropriations of land.............	7 95	
		107,509 80

Contract No. 19:		
Great Lakes Construction Co., contractor	$189,414 00	
Extra or unspecified work (see Canal Board Proceeding, March 23, 1910)	845 44	
Construction of Road "F"	1,044 25	
Construction of Road "D"	874 67	
Construction of Road "H"	1,901 25	
Construction of Road "I"	2,342 20	
Recording appropriations of land	32 50	
		$196,454 31
Contract No. 20-A:		
Houston Barnard, contractor	$41,355 00	
Recording appropriations of land	5 60	
		41,360 60
Contract No. 20-B:		
S. Pearson & Son, Inc., contractor	$20,664 00	
Recording appropriations of land	3 00	
		20,667 00
Contract No. 20-C:		
American Pipe & Construction Co., contractor	$25,065 00	
Recording appropriations of land	17 40	
		25,082 40
Contract No. 20-D:		
Recording appropriations of land	$1 20	
		1 20
Contract No. 21:		
Lane Brothers Company, contractor	$190,818 00	
Advertising	114 00	
Recording appropriations of land	82 00	
		191,014 00
Contract No. 22:		
M. Fitzgerald, contractor	$999 00	
Advertising	158 81	
		1,157 81
Contract No. 23:		
Millard & Lupton Co., contractor	$241,299 00	
Construction of "Brittener Road"	481 64	
Recording appropriations of land	68 00	
		241,848 64
Contract No. 25:		
The National Commercial Bank, Albany, Attorney-in-Fact for The Atlantic, Gulf & Pacific Co., contractor	$329,607 00	
		329,607 00
Contract No. 26:		
Lake Erie Dredging Co., contractor	$2,664 00	
Recording appropriations of land	1 50	
		2,665 50
Contract No. 27-A:		
Advertising	$337 61	
		337 61

Contract No. 29:		
Maryland Dredging & Contracting Co., contractor	$123,930 00	
Recording appropriations of land	30 50	
		$123,960 50
Contract No. 30:		
Acme Engineering & Contracting Co., contractor	$339,444 00	
Recording appropriations of land	89 50	
		339,533 50
Contract No. 31:		
Casey & Murray, contractor	$144,045 00	
Recording appropriations of land	14 10	
		144,059 10
Contract No. 32:		
Penn Bridge Co., contractor	$39,191 31	
		39,191 31
Contract No. 33:		
Penn Bridge Co., contractor	$5,814 00	
Advertising	136 56	
		5,950 56
Contract No. 35:		
Gilmour-Horton-Allen Co., contractor	$87,975 00	
		87,975 00
Contract No. 36:		
Advertising	$118 61	
		118 61
Contract No. 37:		
Advertising	$337 87	
Recording appropriations of land	2 00	
		339 87
Contract No. 38:		
Recording appropriations of land	$2 00	
		2 00
Contract No. 39:		
James Stewart & Co., contractor	$61,002 00	
Advertising	121 88	
Recording appropriations of land	5 00	
		61,128 88
Contract No. 40:		
United Engineering & Contracting Co., contractor	$533,385 00	
Extra or unspecified work (see Canal Board Proceedings, September 8, 1910)	95 16	
Recording appropriations of land	8 50	
		533,488 66
Contract No. 41:		
Butler Brothers Construction Co., contractor	$120,906 00	
Extra or unspecified work (see Canal Board Proceedings, August 4, 1909.)	97 47	
Recording appropriations of land	2 00	
		121,005 47

Contract No. 42:		
Shanley-Morrissey, Inc., contractor	$208,431 00	
Recording appropriations of land	41 25	
		$208.472 25
Contract No. 43:		
M. A. Talbott Co., contractor	$675 00	
Recording appropriations of land	45 00	
		720 00
Contract No. 44:		
Scott Brothers, contractor	$168.228 00	
Advertising	136 56	
Recording appropriations of land	27 00	
		168,391 56
Contract No. 45:		
Scott Brothers, contractor	$76,300 93	
Extra or unspecified work (see Canal Board Proceedings, December 23, 1909)	548 91	
		76,849 84
Contract No. 46:		
Kinser Construction Co., contractor	$169,686 00	
Recording appropriations of land	21 75	
		169,707 75
Contract No. 47:		
Crowell-Sherman-Statler Co., contractor	$474,255 00	
Recording appropriations of land	15 75	
		474,270 75
Contract No. 49:		
Bellew & Merrit Co., contractor	$51,471 00	
Advertising	198 55	
Recording appropriations of land	31 50	
		51.701 05
Contract No. 50:		
Advertising	$158 82	
Recording appropriations of land	12 00	
		170 82
Contract No. 53:		
Scott Brothers, contractor	$123,687 00	
		123,687 00
Contract No. 54:		
Scott Brothers, contractor	$23,958 00	
Advertising	118 61	
		24,076 61
Contract No. 55:		
Arthur McMullen, contractor	$289,008 00	
Recording appropriations of land	87 75	
		289.095 75
Contract No. 60:		
Empire Engineering Corporation, contractor	$351,396 00	
Extra or unspecified work (see Canal Board Proceedings, February 15, March 23, September 8, and December 29, 1910)	5,955 23	

Constructing highway from bridge No. 100 to bridge No. 101	$2,365 48	
Recording appropriations of land	46 00	
		$359,762 71
Contract No. 61:		
Cleveland & Sons Co., contractor	$178,605 00	
Extra or unspecified work (see Canal Board Proceedings, September 8, 1910)	101 70	
Recording appropriations of land	116 00	
		178,822 70
Contract No. 62:		
I. M. Ludington & Sons, Inc., contractor	$16,641 00	
Advertising	379 95	
		17,020 95
Contract No. 63:		
H. S. Kerbaugh, Inc., contractor	$57,510 00	
Advertising	210 15	
Recording appropriations of land	122 00	
		57,842 15
Contract No. 64:		
Empire Engineering Corporation, contractor	$218,475 00	
Recording appropriations of land	43 00	
		218,518 00
Contract No. 66:		
Empire Engineering Corporation, contractor	$181,413 00	
Extra or unspecified work (see Canal Board Proceedings October 25, 1910)	2,788 70	
Construction of Roads "A" and "B"	3,287 98	
Recording appropriations of land	9 50	
		187,499 18
Contract No. 67:		
Larkin & Sangster, contractor	$12,258 00	
Advertising	158 57	
Recording appropriations of land	17 50	
		12,434 07
Contract No. 68:		
Shanley-Morrissey, Inc., contractor	$287,622 00	
Recording appropriations of land	2 00	
		287,624 00
Contract No. 69:		
I. A. Hodge & Co., Inc., contractor	$79,803 00	
Advertising	118 61	
Recording appropriation of land	1 00	
		79,922 61
Contract No. 70:		
Shanley-Morrissey, Inc., contractor	$175,194 00	
Advertising	136 56	
Recording appropriations of land	2 00	
		175,332 56

Contract No. 71:		
Shanley-Morrissey, Inc., contractor	$280,575 00	
Advertising	136 57	
Recording appropriations of land	3 00	
		$280,714 57
Contract No. 72:		
Shanley-Morrissey, Inc., contractor	$236,115 00	
Advertising	118 62	
		236,233 62
Contract No. 73:		
E. M. Graves, contractor	$31,167 00	
Advertising	355 65	
Recording appropriations of land	9 00	
		31,531 65
Contract No. 75:		
Advertising	$198 55	
		198 55
Contract No. 78:		
Cunningham-Woodward Co., contractor	$28,683 00	
Raising highway south of Contract No. 78	2,232 81	
Advertising	121 87	
Recording appropriations of land	25 00	
		31,062 68
Contract No. 79:		
Lupfer & Remick, contractor	$2,529 00	
Advertising	158 57	
		2,687 57
Contract No. 82:		
Advertising	$179 05	
		179 05
Contract No. 90:		
D'Olier Engineering Co., contractor	$7,245 00	
Advertising	393 30	
		7,638 30
General expenses:		
Special agent engaged in the preparation of notices of appropriations of land to be served on, and serving the same on owners, filing in the offices of the clerks of the counties, where land is situated, also the preparation of, and execution of contracts, and filing the labor bonds in the offices of the clerks of the counties in which the contract area is located	$2,584 65	
Paid watchmen on and oil for temporary canal at Mindenville, Montgomery county	1,693 50	
Repairs to Dunham's Basin bridge on site of Contract No. 27	4,610 41	
Raising approaches to temporary bridge at Fort Edward on site of Contract No. 27	659 69	

Repairs to Howland's Island bridge on site of Contract No. 5	$350 79	
Painting guard rails and repairs to Dunham's Basin bridge on site of Contracts No. 3 and 27-A	98 28	
Painting houses at Crockers near Moses Kill on site of Contract No. 3	101 25	
Repairs to leaks in Culverts Nos. 44, 45 and 49 on Section No. 9, Erie canal on site of Contract No. 60	4,916 64	
Paid stenographer for reporting investigation relative to work at Rome	110 40	
Publishing notices, appropriating cemeteries	81 00	
Publishing notices, for sale of hay	35 00	
Paid patrolman on Contract No. 40	652 00	
Paid photographer, for services and expenses and photographic supplies	914 80	
Stationery	61 25	
		$16,869 66
		$8,657,314 91

STATEMENT No. 10.

Statement of Moneys Paid into the State Treasury by the Superintendent of Public Works from January 1, 1910, *to January* 1, 1911.

Received from David H. Lewis, Assistant Superintendent, for privileges granted for cutting ice.

Ice Privileges.

William Gilboy	$25 00	
W. N. Carpenter Co.	6 25	
S. Dotter Estate	272 50	
D. Norton Ice Co	395 00	
Consumers' Ice Co.	75 00	
J. H. Connors	6 25	
Oathout Ice and Coal Co.	31 25	
Nadler Brothers	6 25	
W. J. Currie	18 75	
Albert Cole	12 50	
John Errgong	15 00	
McDermott Dairy Co	25 00	
Retallic & McBain	31 25	
D. McCarthey & Sons	87 50	
P. Ryan	2 50	
Wm. Shover	12 50	
Daniel Norton Ice Co.	25 00	
W. J. Currie	18 75	
B. Baker Beef Co.	25 00	
S. Dotter Estate Ice Co	272 50	
		$1,363 75

Received from Charles C. Barrett, Assistant Superintendent, for privileges granted for cutting ice.

Ice Privileges.

Standard Dairy Co.	$25 00	
Daniel Kean	3 13	
Thos. H. Mitchell	6 25	
J. E. Austin	3 13	
Fred Mosher	3 12	
T. L. Shoerman	3 13	
Wm. Burn	3 13	
Owen Russell	3 13	
Chas. Constigan	3 13	
Tracey Hotel	3 13	
Jos. Hanrahan	3 13	
Arlin Haan	3 13	
Fred R. Peck	75 00	
C. E. Maynard & Son	10 16	
		$147 70

Received from Henry A. Kunze, Assistant Superintendent for privileges granted for cutting ice and other purposes.

Ice Privileges.

Henry Miller	$10 00	
B. O. Warth	25 00	
D. Clair	50 00	
		85 00

Other Purposes.

Co-operative Foundry Co., 89 loads of stone taken from spoil bank on Barge Canal Contract No. 6.	$22 25	
Worthington & Sill, services of pump boat and towing boats, "Valiant" and "Huntley"	37 45	
Ryan Elevator & Forwarding Co.—Services of crew of State scow, "Rochester" in assisting boat "Joseph Brant" from lock 64 to dry dock at lock 66	18 00	
City of Lockport for painting water pipe crossing Pine street bridge	15 00	
Empire Engineering Corporation, 7 pieces of spruce	24 85	
		117 55

New York, Ontario & Western Railway Co., Ice privilege	$200 00	
		200 00

Schenectady Contracting Co., for rental of State land situated on the berme side of the Erie canal between Nott and Jefferson streets, in the city of Schenectady, from February 1, 1910, to February 1, 1911	$300 00	
		300 00

George W. L. Smith, for one and one-half story building located within the blue line of Champlain canal, north of waste weir ditch at Smith's Basin, the building to be removed from State land, all nuisances to be abated and the site left in a smooth and clear condition, as per bill of sale February 14, 1910	$300 00	
		$300 00
F. W. Wright, chairman town board, town of Gates, Monroe county, 2,659 loads of stone taken from site of Barge Canal Contract No. 6	$531 80	
		531 80
Rochester Security Co., 1,022 yds. of stone taken site of Barge Canal Contract No. 6	$204 40	
		204 40
John Dunn, 170 yds. of stone taken from site of Barge Canal Contract No. 6	$34 00	
		34 00
Carl Paul, dwelling-house and outbuilding located on Parcel No. 1749 on site of Barge Canal Contract No. 23, as per bill of sale May 6, 1910	$225 00	
		225 00
S. Peason & Son, Inc., 2,919 cubic yds. rock taken from site of Barge Canal Contract No. 20–B	$437 85	
		437 85
H. S. Kerbaugh, Inc., for buildings and structures appropriated for Barge canal purposes on site of Barge Canal Contract No. 63, as per bill of sale August 25, 1910	$1,000 00	
		1,000 00
Shanley-Morrissey, Inc., 19,401 yds. spoil stone taken from site of Barge Canal Contract No. 42	$1,552 08	
		1,552 08
Putnam & Hare, Inc., 425 yds. sand taken from spoil bank near Whitehall	$63 75	
		63 75
Chas. Higgins, cutting and removing flag from Barge canal lands in the towns of Tyre, Seneca county and Savannah, Wayne county as per bill of sale August 8, 1910	$50 00	
		50 00
H. S. Kerbaugh, Inc., for buildings on site of Barge Canal Contract No. 63, as per bill of sale November 30, 1910	$1,000 00	
		1,000 00
Acme Engineering & Contracting Co., 18,456 yds. of stone taken from site of Barge Canal Contract No. 14	$533 68	
		533 68

Laurence Shaughnessy, for buildings on sites of Parcels 735, 975, 1323, 1324 and 1325, appropriated for Barge canal purposes on site Barge Canal Contract No. 14	$350 00	
		$350 00
Oswego River Power Transmission Co., rental for year 1911, covering right of way for transmission system and poles located on the line of the Oswego canal at Fulton and Baldwinsville as per permit granted November 16, 1910	$83 00	
		83 00
"Comptroller of the Currency," 5th dividend on $9,500.00 deposited in the American Exchange National Bank of Syracuse by the city of Syracuse, July 8, 1903, being the city's share of the cost of constructing a bridge over the Oswego canal at Willow street, in said city, deposited now with the State treasurer as provided for by chapter 700, laws of 1905	$475 00	
		475 00
For sale of hay on lands appropriated for Barge Canal Contract No. 14.		
Theo. Marcoux, Map No. 1681	$50 00	
Bensom Brick Co., Map No. 1736	10 00	
Geo. N. and Adam V. Fraleigh, Map No. 2166	45 00	
Chas. Orlup, Map No. 1937	10 50	
Fred W. Burhmaster, Map No. 2155	75 00	
Arron Pearse, Map No. 2021	100 00	
Louis Berger, Maps Nos. 2159 and 2164	50 00	
Peter Hollahan, Map No. 2115	24 60	
Wm. T. Ford, Map No. 2212	21 00	
Fred Teagel, Map No. 2183	30 00	
S. A. Creiger, Maps Nos. 2022, 2057, 2070 and 2023	40 00	
Anson Woodin, Map No. 2066	18 00	
Wm. H. Smith, Map No. 2271	20 00	
Jas. Onderdonk, Maps Nos. 2077 and 2112	27 50	
Chas. Trivley, Lessee, Map No. 2168	40 00	
Geo. H. Smith, Map No. 2269	10 00	
Thos. W. Winnie, Maps Nos. 1938 and 1940	25 00	
Frank T. Pearse, Map No. 2253	35 00	
Walter Wands, Map No. 2080	4 00	
D. R. Godfrey, Map No. 2068	15 00	
Lawrence Shaughnessy, Map No. 1325	31 25	
		881 85
Moot, Sprague, Brownell & Marcy, certifying to a copy of a lien	$0 25	25
Fees received for filing liens, mortgages and making searches on canal boats:		
Joseph Harper	$0 50	
Estate of M. Doren	10 50	

Albert Annis	$0 25
R. Vanderworker	50
Chas. Knapp	25
W. P. Doren	75
State Comptroller	1 38
W. H. Warwick	5 75
Ira M. Rose	50
Wm. H. Follette	50
Frank Johnson	25
Frank A. Robinson	50
O. B. & H. F. Tanner	2 00
E. W. Hayes	25
Ellen Carpenter	26
Geo. B. Jillson	26
A. G. Meil	1 25
Crangle & Burt	50
Geo. W. DeWitt	25
P. J. Fermile	25
Geo. B. Russell	50
Patrick McDonald	26
D. A. Hawkins	25
Drummond & Drummond	8 75
Geo. Ward	25
John B. McCarthey	26
Edward W. Jackson	25
Lockport Dry Dock	2 00
Chas. R. Sperry	25
Wise & Selligsberry	25
Peter S. Carter	25
W. F. Hofheins	25
H. S. Willson	25
W. E. Sipple	50
Hubert Riley	1 25
Geo. C. Williams	25
Milo Brown	50
Geo. R. Sheldon	25
Geo. H. Sanders	25
White & Stanley	17 00
Albert L. Lockwood	25
Henry S. Kahn	50
Fred & Pierce Land Co	25
Jas. L. Conlon	50
Chas. Burdon	25
Hood Coal Co	50
Daniel Smith	25
Wm. H. Nealer	25
Ellis Scouton	1 00
Thos. M. Ryan	75
Hall Iron Works	76
John Knickerbocker	50

John J. Warner	$0 25	
R. W. Potter	50	
W. J. Wilson	25	
Clarence & Howard Brown	25	
Edwin I. Rose	1 00	
Burwick & Adams	25	
T. A. Devereaux	50	
Frank R. Johnson	25	
C. L. Haines	50	
Geo. F. Thompson	25	
Chas. E. Knoll	25	
Nicholas Steenburg	25	
Dennis Meagan	25	
Harcourt & Bull	2 00	
J. B. Curtiss	25	
Norman D. Fish	25	
Geo. A. Knobloch	25	
		$73 68
Interest 2% on daily balances in New York State National Bank during the administration of F. C. Stevens, Superintendent of Public Works	$2,880 88	
		2,880 88
From W. S. Van Keuren, Inspector of steam vessels, fees collected for inspection of steam vessels and issuing original and renewal licenses, pursuant to chapter 42, Laws of 1909:		
1910.		
April	$124 50	
May	442 00	
June	1,082 00	
July	894 50	
August	592 00	
September	533 50	
October	582 50	
November	9 00	
		4,260 00
		$16,971 22

Statement of proposals received and contracts awarded by the Superintendent of Public Works during the year 1910, *pursuant to special acts of the Legislature:*

For constructing a lift bridge over the Erie Canal at Franklin street, Syracuse. (Chapters 453 and 527, Laws of 1909 and 1910.)

Steel Storage & Elevator Construction Co., Buffalo, N. Y.	$38,245 75
Raymond Kelton, Albany, N. Y.	46,963 50
Lupfer & Remick, Buffalo, N. Y.	44,608 75
W. J. Burns Co., Syracuse, N. Y.	45,576 75

Awarded to Steel Storage & Elevator Construction Co.

For constructing a highway bridge over the Erie canal at South Washington street, Rome, Oneida county, N. Y.:

(Chapter 522, Laws of 1910.)

N. D. Peters Co., Utica, N. Y.	$15,600 50
Lupfer & Remick, Buffalo, N. Y.	16,955 00
David I. Rowger, New York	16,273 25
Scott Bros., Rome, N. Y.	15,164 25
Henry Tosh & Son, Port Byron, N. Y.	14,777 50
M. Fitzgerald, Hoosick Falls, N. Y.	16,265 40

Awarded to Henry Tosh & Son.

Statement of proposals received and contracts awarded by the Superintendent of Public Works during the year 1910, *paid from funds provided for the ordinary repairs of the canals:*

(Chapters 432 and 512, Laws 1909 and 1910.)

For furnishing timber and planks for use on the Eastern Division:

H. V. Berry, Fort Plain, N. Y., all kinds	$18,527 25
G. Elias & Brother, Buffalo, N. Y., all kinds	20,914 50
Dexter Hunter, Albany, N. Y., Georgia pine	7,042 50
C. R. Snell, Herkimer, N. Y., Georgia pine	6,434 25

Awarded to H. V. Berry.

For furnishing timber and planks for use on the Middle Division:

G. Elias & Brother, Buffalo, N. Y., all kinds	$18,081 75
B. & S. Lumber Co., Fort Plain, N. Y., all kinds	18,507 00
Wm. J. Dowdle, Oswego, N. Y., all kinds	16,275 50
Dexter Hunter, Albany, N. Y., Georgia pine	812 50
C. R. Snell, Herkimer, N. Y., Georgia pine	737 50

Awarded to Wm. J. Dowdle.

For furnishing timber and planks for use on the Western Division:

Wm. J. Dowdle, Oswego, N. Y., all kinds	$25,808 00
G. Elias & Brother, Buffalo, N. Y., all kinds	26,784 50
H. V. Berry, Fort Plain, N. Y., all kinds	27,112 00
Dexter Hunter, Albany, N. Y., Georgia pine	4,940 00
C. R. Snell, Herkimer, N. Y., Georgia pine	4,926 00

Awarded to Wm. J. Dowdle.

Statement of proposals received and contracts awarded by the Superintendent of Public Works during the year 1910, *pursuant to chapter* 147, *Laws of* 1903 *and amendments thereto known as "Barge Canal Act."*

Contract No. 49:

Bellew & Merritt Co., Tuckahoe, N. Y.	$750,279 25

Awarded to Bellew & Merritt Co.

Contract No. 75:

The Massillon Bridge and Structural Co., Massillon, Ohio	$43,025 00
Whitehead & Kales Iron Works, Detroit, Michigan	43,368 50
Recrs. of J. B. & J. M. Cornell Co., New York	42,917 00

Awarded to the receivers of the J. B. & J. M. Cornell Co.

Contract No. 21:

Maryland Dredging & Contracting Co., Baltimore, Md	$1,496,028 00
Frederick A. Brotsch, Jr., Rochester, N. Y	1,387,510 00
Carter Construction Co., Chicago, Ill	1,452,400 00
Wm. T. Gaynor & I. A. Hodge & Co., Inc., Syracuse, N. Y	1,498,860 40
Lane Brothers Co., Altavista, Va	1,323,150 00

Awarded to Lane Brothers Co.

Contract No. 39:

S. Pearson & Son, Inc., New York	$1,135,470 60
Jas. Stewart & Co., New York	1,048,674 40

Awarded to Jas. Stewart & Co.

Contract No. 73:

No bids received.

Contract No. 78:

Scott Brothers, Rome, N. Y	$56,545 00
Cunningham & Woodard, Hudson Falls, N. Y	47,721 50
Parker & Beebe, Waterford, N. Y	51,310 00
I. M. Ludington & Son, Inc., Rochester, N. Y	51,995 00
Theo. C. Hailes, Jr., Albany, N. Y	56,931 50
Louis J. D'Isa, Rochester, N. Y	51,904 00
D. C. Stephens, Buffalo, N. Y	51,479 00

Awarded to Cunningham & Woodard.

Contract No. 99:

Lord Construction Co., New York, informal.	
Northeastern Construction Co., New York	$179,982 95
D'Olier Engineering Co., Philadelphia, Pa	178,197 09

Awarded to D'Olier Engineering Co.

Contract No. 63:

Maryland Dredging & Contracting Co., Baltimore, Md	$2,052,844 10
American Pipe & Construction Co., Philadelphia, Pa	2,014,411 00
H. S. Kerbaugh, Inc., Philadelphia, Pa	1,990,043 00
Butler Brothers Construction Co., New York	2,354,379 00

Awarded to H. S. Kerbaugh, Inc.

Contract No. 73:

E. M. Graves, Cleveland, Ohio	$767,467 00
S. Pearson & Son, Inc., New York	1,201,618 00

Awarded to E. M. Graves.

Contract No. 62:

I. M. Ludington & Sons, Inc., Rochester, N. Y.	$2,347,836 00

Awarded to I. M. Ludington & Sons, Inc.

Contract No. 27-A:

No bids received.

Contract No. 67:

Larkin & Sangster, St. Catherines, Ontario, Canada	$1,149,401 25
S. Pearson & Son, Inc., New York	1,415,914 00
Smith, McCormick Co., Easton, Pa	1,416,025 00
Buffalo Dredging Co., Buffalo, N. Y.	1,285,395 00
Mac Arthur Brothers Co., New York	1,236,471 55

Awarded to Larkin & Sangster.

Contract No. 79:

Lupfer & Remick, Buffalo, N. Y.	$37,480 00
G. & W. Manufacturing Co., New York	41,766 00
United Construction Co., Albany, N. Y.	38,656 00
M. Fitzgerald, Hoosick Falls, N. Y.	40,499 00
E. J. Doyle & Co., Albany, N. Y.	37,931 00

Awarded to Lupfer & Remick.

Contract No. 22:

M. Fitzgerald, Hoosick Falls, N. Y.	$110,436 00
Lupfer & Remick, Buffalo, N. Y.	129,519 00
W. J. Burns Co., Syracuse, N. Y.	117,786 00

Awarded to M. Fitzgerald upon reducing proposition to $110,268.00.

Contract No. 37:

No bids received.

Contract No. 50:

Buffalo Dredging Co., Buffalo, N. Y.	$963,415 00
Larkin & Sangster, St. Catherines, Ontario, Canada	1,015,381 50
Michael J. Dady, Brooklyn, N. Y.	1,110,899 00
Lane Brothers Co., Altavista, Va.	1,048,799 00

Awarded to Buffalo Dredging Co.

Contract No. 27-A:

Holler & Shepard, Rochester, N. Y.	$449,498 70

Awarded to Holler & Shepard.

Contract No. 37:

American Pipe & Construction Co., Philadelphia, Pa.	$2,323,998 50
S. Pearson & Son, Inc., New York	2,479,504 65

Awarded to American Pipe & Construction Co.

Contract No. 82:

Lupfer & Remick, Buffalo, N. Y.	$29,135 00
M. Fitzgerald, Hoosick Falls, N. Y.	28,973 75
Groton Bridge Co., Groton, N. Y.	28,841 50

Awarded to Groton Bridge Co.

Contract No. 4-B:

Henry Tosh & Son, Port Byron, N. Y.	$1,446 17
E. J. Doyle & Co., Albany, N. Y.	1,396 60

Awarded to E. J. Doyle & Co., upon reducing proposition to $1,385.12.

Contract No. 48:

S. Pearson & Son, Inc., New York	$1,780,112 50
The M. A. Talbott Co., Baltimore, Md.	1,725,151 50
The Crowell-Sherman-Stalter Co., Cleveland, Ohio	1,701,671 50

Awarded to Crowell-Sherman-Stalter Co.

Contract No. 51:

Shnable & Quinn, Chicago, Ill.	$402,446 00
Lane Brothers Co., Altavista, Va.	398,835 00
Joseph F. Stabel Co., Buffalo, N. Y.	397,905 00
Geo. T. Cunningham, Utica, N. Y.	389,842 50
Coast & Interior Contracting Co., Fayetteville, N. Y.	400,365 00
Barge Canal Construction Co., New York	437,242 00
Baker & Banker, Herkimer, N. Y.	499,535 75

Awarded to Geo. T. Cunningham.

Contract No. 76:

The T. A. Gillespie Co., New York	$1,494,057 40

Awarded to the T. A. Gillespie Co.

Contract No. 77:

The T. A. Gillespie Co., New York	$1,652,148 20

Awarded to the T. A. Gillespie Co.

Contract No. 80:

Scott Brothers, Rome, N. Y.	$146,603 80
Walter Bradley, Fulton, N. Y.	117,390 64
W. J. Burns Co., Syracuse, N. Y.	147,556 50

Awarded to Walter Bradley.

Contract No. 91:

Brown & Lowe, Schenectady, N. Y.	$54,629 00
John W. Flynn, Waterford, N. Y.	43,595 00
D'Olier Engineering Co., Philadelphia, Pa.	51,898 00
Welles-Boughton Co., Troy, N. Y.	42,940 50

Awarded to Welles-Boughton Co.

Contract "A" Cayuga and Seneca canal:

Scott Brothers, Rome, N. Y.	$357,627 00
Larkin & Sangster, Lockport, N. Y.	421,653 50
W. J. Burns Co., Syracuse, N. Y.	387,278 50
H. P. Burgard Co., Buffalo, N. Y.	380,528 00
Great Lakes Construction Co., Buffalo, N. Y.	397,777 77
Mac Arthur Brothers Co., New York	364,366 50
Sundstrom & Stratton Co., New York	400,139 50
Coast & Interior Contracting Co., Fayetteville, N. Y.	399,224 50

Awarded to Scott Brothers.

Contract "B" Cayuga and Seneca canal:

Grant Smith & Co. & Locker, Grosse Ile., Mich	$1,688,550 00
Sundstrom & Stratton Co., New York	1,593,080 00
American Pipe & Construction Co., Philadelphia, Pa.	1,555,640 00
Crowell-Sherman-Stalter Co., Cleveland, Ohio	1,448,550 00
S. Pearson & Son, Inc., New York	1,678,162 50
American Dredging & Contracting Co., Baltimore, Md.	1,576,550 00

Awarded to Crowell-Sherman-Stalter Co.

Fees collected by the Inspectors of Steam Vessels for the inspection of steam vessels and issuing of original and renewal licenses, pursuant to chapter 359, Laws of 1905, from January 1, 1910, to January 1, 1911:

For inspection of steamer "Sagamore"	$25 00
For inspection of steamer "Horicon"	25 00
For inspection of steamer "Mohican"	25 00
For inspection of steamer "Blanche"	5 00
For inspection of steamer "C. W. Lodge"	7 50
For inspection of steamer "W. McMullen"	12 50
For inspection of steamer "City of Syracuse"	25 00
For inspection of steamer "Glen Haven"	10 00
For inspection of steamer "Nixie"	5 00
For inspection of steamer "Kelse"	5 00
For inspection of steamer "Lotus"	7 50
For inspection of steamer "Springsted"	25 00
For inspection of steamer "Steuben"	25 00
For inspection of steamer "Redwing"	5 00
For inspection of steamer "Nymph"	10 00
For inspection of steamer "Ella H."	5 00
For inspection of steamer "Agnes"	10 00
For inspection of steamer "Deerslayer"	10 00

For inspection of steamer “Mohican”	$12 50
For inspection of steamer “Pathfinder”	10 00
For inspection of steamer “Polly”	5 00
For inspection of steamer “Wa-ta-wa”	5 00
For inspection of steamer “Ramona”	5 00
For inspection of steamer “Hilda”	5 00
For inspection of steamer “Kohanza”	5 00
For inspection of steamer “Gipsey”	5 00
For inspection of steamer “Candarago”	5 00
For inspection of steamer “Deowango”	5 00
For inspection of steamer “Stella”	5 00
For inspection of steamer “Vixen”	7 50
For inspection of steamer “Robert”	5 00
For inspection of steamer “Lefty”	5 00
For inspection of steamer “Caprice”	5 00
For inspection of steamer “Cornell”	7 50
For inspection of steamer “Dana”	7 50
For inspection of steamer “Augusta”	5 00
For inspection of steamer “Col. Horton”	12 50
For inspection of steamer “Chas. Kellogg”	10 00
For inspection of steamer “Cayuga”	25 00
For inspection of steamer “Mohawk”	12 50
For inspection of steamer “Iroquois”	12 50
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From Frank Foltz, for renewal of license	3 00
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From R. Wadsworth, for renewal of license	3 00
From J. R. Conklin, for renewal of license	3 00
From E. W. Cole, for renewal of license	3 00
From Harry Stevens, for renewal of license	3 00
From A. H. Gazelly, for renewal of license	3 00
	$4,260 00

The above amount of money has been deposited with the State Treasurer and can be found in Statement No. 10.

SUPERINTENDENTS OF PUBLIC WORKS.

SUPERINTENDENTS.	Residences.	Appointed.
Benjamin S. W. Clark	Sing Sing	Jan. 30, 1878
Silas B. Dutcher	Brooklyn	Jan. 16, 1880
James Shanahan	Tribes Hill	Jan. 16, 1883
Edward Hannan	Troy	Dec. 16, 1889
George W. Aldridge	Rochester	Jan. 2, 1895
John N. Partridge	Brooklyn	Jan. 16, 1899
Charles S. Boyd	New York	Dec. 20, 1901
N. V. V. Franchot	Olean	Jan. 4, 1905
Frederick C. Stevens	Attica	Jan. 14, 1907
DEPUTY SUPERINTENDENTS.		
Patrick J. McWeeney	Herkimer	Oct. 6, 1896
Elon H. Hooker	New York	Feb. 1, 1899
Winslow M. Mead	Rochester	Aug. 25, 1901

ASSISTANT SUPERINTENDENTS.

Eastern Division	David H. Lewis, Tribes Hill
Middle Division	Chas. C. Barrett, Roochester
Western Division	Henry A. Kunze, Rochester

ROSTER OF EMPLOYEES IN THE OFFICE OF SUPERINTENDENT OF PUBLIC WORKS.

Financial Clerk	P. J. McWeeney
Assistant Financial Clerk	Edward L. Walsh
Clerk of Statistics	John E. Winne
Chief Clerk	Alfred M. O'Neill
Stenographer	Jessie E. Holmes
Index Clerk	F. S. Harder
Special Agent	D. D. N. Marvin
Messenger	Frank Langwig

BOUNDARIES OF DIVISIONS AND SECTIONS OF THE CANALS.

The following are the boundaries of the divisions of the canals as fixed by the Canal Board, August 16, 1900:

EASTERN DIVISION.

Erie canal.— From the south end of the Albany basin to the easterly line of Oneida county; Champlain canal, and their tributary feeders.

MIDDLE DIVISION.

Erie canal.— From the easterly line of Oneida county to the easterly line of Wayne county; Black River canal; Oswego canal; Cayuga and Seneca canal, and their tributary feeders.

WESTERN DIVISION.

Erie canal.— From the easterly line of Wayne county through the city of Buffalo, including its tributary feeders.

The boundaries of the sections of the canals have been fixed as given below:

ERIE CANAL.

Section 1. Erie canal, from the south end of the Albany basin to the west end of lower Mohawk aqueduct, including Watervliet basin, and the Watervliet and Port Schuyler sidecuts; also the

Champlain canal from its junction with the Erie canal to a point 200 feet north of the Cohoes guard-lock.

Section 2. Erie canal, from west end of the lower Mohawk aqueduct to the head of lock 27.

Section 3. Erie canal, from the head of lock 27 to the head of lock 34.

Section 4. Erie canal, from the head of lock 34 to the easterly line of Oneida county.

Section 5. Erie canal, from the easterly line of Oneida county to the westerly side of Peterboro street bridge in the village of Canastota.

Section 6. Erie canal, from the westerly side of Peterboro street bridge in the village of Canastota to and including the Camillus feeder. Also that portion of the Oswego canal from its junction with the Erie canal in the city of Syracuse to and including lock No. 4 known as Mud lock, on the Liverpool level.

Section 7. Erie canal from the westerly side of Camillus feeder to the easterly line of Wayne county.

Section 8. Erie canal, from the easterly to the westerly line of Wayne county.

Section 9. Erie canal, from the westerly line of Wayne county to the westerly line of Monroe county.

Section 10. Erie canal, from the westerly line of Monroe county to the head of the guard-lock west of Lockport.

Section 11. Erie canal, from the head of the guard-lock west of Lockport, through the city of Buffalo, including Black Rock harbor, Erie and Ohio basins and the Clark and Skinner canal.

CHAMPLAIN CANAL.

Section 1. Champlain canal, from a point 200 feet north of Cohoes guard-lock to the foot of lock 11, including the Troy sloop-lock and dam and the pond above.

Section 2. Champlain canal, from the foot of lock 11 to the north side of waste-weir at Dunham's Basin; also, Glens Falls feeder, the feeder dam and pond above.

Section 3. Champlain canal, from the north side of the waste-weir at Dunham's Basin to Lake Champlain.

BLACK RIVER CANAL.

Section 1. Black River canal, from the junction of the Black River canal with the Erie canal to the foot of lock 71, at Boonville; the feeder from Boonville to Forestport; the Black river above the dam at Forestport, including the dam; also all the reservoirs and feeders tributary to the canal and feeder as described above.

Section 2. Black River canal, from the foot of lock 71, at Boonville, to Black river, at Lyons Falls; the Black river improvement from Lyons Falls to Carthage, including the dam; also Moose river improvement.

OSWEGO CANAL.

Oswego canal from lock No. 4, known as Mud lock, through Oswego, including the Seneca river towing path, the Baldwinsville canal and the Oneida river improvement.

CAYUGA AND SENECA CANAL.

Cayuga and Seneca sections.— Cayuga and Seneca canal, from Montezuma to Geneva, with spur from Mud lock to Cayuga lake.

EASTERN DIVISION.

REPORT OF THE ASSISTANT SUPERINTENDENT OF PUBLIC WORKS.

Office of the
Assistant Superintendent of Public Works,
Eastern Division of the Canals,

Albany, N. Y., *December* 31, 1910.

Hon. F. C. Stevens, *Superintendent of Public Works:*

Dear Sir.— I herewith submit my annual report for the fiscal year ended September 30, 1910, for the Eastern Division of the canals.

This division comprises that portion of the Erie canal extending from:

	Miles.
Albany to east line of Oneida county............	106.24
Albany basin (Laws of 1849).....................	.77
Port Schuyler and West Troy side-cuts...........	.35
Mohawk feeder (Little Falls)....................	.50
	107.86
Champlain canal and Waterford side-cut..........	66.00
Pond above Troy dam.............................	3.00
Glens Falls feeder and pond above...............	12.00
	81.00
Total Erie and Champlain canals	188.86

Navigation officially opened on the Erie and Champlain canals at noon May 15th, and closed at midnight November 15th.

The interruptions to navigation on the Eastern Division the past season were as follows:

On Sunday evening, August 28th, there was a break in the towing-path bank of the Erie canal by reason of the settling of double-dive culvert No. 78, located about 600 feet easterly from the Albert Keno farm bridge No. 147, in the village of Ilion. After the level had been sufficiently drawn, and the pit which the rush of water at time of break had formed under and alongside of culvert had been pumped out so an examination could be made, it was found that at a location about the center line of the prism of the canal under the culvert there was a section of very fine sand, extending from the middle of the canal to and under the towing-path bank, and through said course of sand I believe leakage from culvert had percolated for a long time, causing a small, but constant wash. This culvert being of the dive pattern, as is the case with most culverts of this kind, was at all times full of water, and small leakage might have extended over a number of years and not be discovered.

Work of repairs was prosecuted without any intermission until completed, and both culverts were, in my opinion, so repaired that the canal at this location is perfectly safe. Began feeding the levels, which were necessarily drawn on account of the break at 8 P. M. September 7th, resuming navigation at noon September 8th.

On the night of October 18th the high canal bank between locks Nos. 7 and 8 gave way without showing any previous cause why the bank had become weakened, making a breach in the towing-path at this point about 125 feet long and washing out the towing-path bank twelve feet below the canal bottom. Repairs were promptly begun and the work prosecuted vigorously and without intermission until completed. Began feeding levels on the evening of October 25th and resumed navigation at 7 A. M. October 26th.

Navigation on the Champlain canal and the Glens Falls feeder was continuous and uninterrupted during the entire season.

On March 4th there was serious damage done to portions of the towing-path of Section 2, Erie canal, westerly from Schenectady and between Rexford Flats and the Lower Mohawk aqueduct, the towing-path being badly scoured out on account of flood conditions in the Mohawk river in the vicinity of Vischers Ferry and Dunsbach Ferry. Also, from the same cause, the towing-path bank at Dunsbach Ferry was washed out for a distance of about 300 feet and about 6 feet below the canal bottom. As soon as the Mohawk river had sufficiently subsided, repairs were gotten under way, working only day forces on account of it being the closed season for navigation with ample time to make repairs with one shift of employees previous to the time of opening of navigation.

The past season, after the middle of June, was unusually dry, causing extraordinary low feed from all of the feeders supplying water for the Eastern Division of the canals. The Schoharie creek feeder, located at Fort Hunter, and supposed to maintain canal levels from below lock No. 29 at Fort Hunter to lock No. 22 at Rexford Flats, a distance of about twenty-six miles, became so low as to furnish practically no feed at all during the months of July and August. Notwithstanding this extraordinary low water all levels on the Eastern Division have been kept at proper navigation height. Such conditions were made possible only by the willing co-operation and close attention to their duties by every Section Superintendent on the Eastern Division, to whom much credit should be given.

All necessary repairs have been made to the State dams on the Eastern Division, with one exception, that is, the State dam across the Mohawk river between Waterford and Cohoes. This dam is in practically the same condition as mentioned in my last report and the recommendations made at that time I believe should be carried out during the coming season, at time of low water.

The State dredges Nos. 1 and 3, and the tugs George W. Aldridge and B. B. Odell, Jr., were thoroughly overhauled and placed in excellent condition for service, and were constantly employed during the season at different points on the Division where necessary.

The State stone quarry at Fort Hunter was operated continuously after June 13th until the close of navigation, and the product, consisting of one full boatload of rough stone daily, was used for riprapping high banks and filling timber cribs for strengthening the towing-path banks on Section 2 of the Erie canal between locks Nos. 24 and 25. The towing-path banks in question are some thirty feet and upward in height and parallel with the Mohawk river at a location where ice jams invariably form. While the work done in this vicinity last season will be a great protection to the towing-path, I would advise the construction of cribs and placing of riprap be continued next season as several points where the protection made this year does not cover.

During the past closed season the bottom of the Glens Falls feeder from bridge No. 10 to waste weir No. 1, a distance of 1,300 lineal feet, was excavated to a proper depth and the feeder for this distance improved by the construction of new concrete bottom and side walls. This is a continuation of the betterments being made each year for the past several years by the Department during the closed season of navigation, saving thereby large quantities of water which, previous to the time improvements were started, wasted into the Hudson river on account of the seamy rock formation underlying the prism of the feeder, the waste of water being so great in years previous as to cause at many times serious interruption to navigation on the feeder and Section 2 of the Champlain canal.

All weeds and brush have been cut over the entire Division and ditching done where necessary. I would also mention that brush and trees on Section 2, Erie canal, were cleanly cut off the slope of the towing-path bank, as far as the blue line extended, between lock No. 28 and Schenectady, on account of this bank being seepy and at many points parallel with the Mohawk river. I believe this work will prove of great benefit, as the banks will have an opportunity to dry out, and will be much safer by reason of being exposed for examination by bank watchman.

I would advise the coming season that all towing-path banks on the Eastern Division, parallel with rivers, be thoroughly cleaned of all brush, trees, etc., as far as the blue line extends, as this has not been done in a number of years and the growth has become so dense that there are many miles of canal banks where it is a physical impossibility for a bank watchman, no matter how good his intentions may be, to properly inspect in going over his beat.

Six and one-quarter miles of towing-path at various points where necessary have been raised and improved with gravel. While this would appear but a small section of towing-path to have raised and improved on the Eastern Division for one season, it is owing entirely to the fact that during your administration seventy-five miles of towing-path on this Division have been raised with gravel and crushed stone, placing the roadway of the towing-path at the present time in almost perfect condition for the use for which it was intended.

The towing-path and berme banks were improved where needed with round timber docking one, two and three sticks high for a distance of three and one-half miles.

One new State scow was built at the State shops at Cohoes.

About twenty-five miles of towing-path was scraped and cross-ditched during the past season, which practically completes this class of work on this Division.

GENERAL IMPROVEMENTS ON THE EASTERN DIVISION OF THE CANALS FROM JANUARY 1, 1910, TO JANUARY 1, 1911.

Section No. 1, Erie Canal.

New lock gates have been installed in locks Nos. 1, 3, 4, 9, 13 and 15. River lock, upper sidecut, Watervliet; and lock No. 2 of Champlain canal. Upper and lower bulkheads through the "Sixteens" repaired.

Vertical walls between lock No. 18 and Lower Mohawk aqueduct at various places were relaid.

Docking rebuilt at the head of locks Nos. 14 and 17, east side.

Vertical wall at head of lock No. 12, east side, repointed and grouted.

Lower Mohawk aqueduct caulked.

Docking repair between bridge No. 3 and lock No. 2; between bridges Nos. 15 and 19; and between locks Nos. 3 and 18.

Concrete retaining wall built at approach to bridge No. 4.

Towing-path scraped and graveled through the city of Watervliet; at various places between lock No. 3 and Lower Mohawk aqueduct.

Ice fenders on piers of Lower Mohawk aqueduct replaced.

Many bridge approaches graveled.

Repaired break in the towing-path between locks Nos. 7 and 8. Vertical walls on both sides of the canal between locks Nos. 7 and 8 veneered with six inches of concrete.

The sides of six spans of the Lower Mohawk aqueduct taken out, the sides braced and a temporary dam erected under bridge No. 34, as a protection against floods.

Section No. 2, Erie Canal.

New feeder gates have been placed in Rexford Flats feeder.

Towing-path repaired east of bridge No. 75.

Entire new trunk built in one span of the Upper Mohawk aqueduct.

Bridges Nos. 61 and 84 repaired.

Break in the towing-path at Dunsbach Ferry repaired.

Docking repaired from Lower Mohawk aqueduct westerly 1,500 lineal feet, and between bridge No. 49 and lock No. 21.

Towing-path raised, graveled and cross-ditched from Lower Mohawk aqueduct westerly 1,500 lineal feet; between bridge No. 49 and lock No. 21; from aqueduct No. 4 westerly one mile; from lock No. 26 easterly one and one-half miles, and west of bridge No. 65.

Timber cribs built and filled with stone west of lock No. 24 and east of bridge No. 65.

Towing-path embankment riprapped with stone west of aqueduct No. 3.

Basin above Pattersonville aqueduct cleaned out.

Berme bank west of bridge No. 74 raised with gravel.

Banks between bridge No. 64 and Lock No. 26 cleared.

Ditches have been cleaned out where most necessary.

Bridges Nos. 44 and 55 rebuilt.

One hundred lineal feet of vertical wall rebuilt between bridge No. 57 and New York Central & Hudson River Railroad bridge.

Waste weir and spillway No. 7 repaired.

Two new gates installed in lock No. 25.

Section No. 3, Erie Canal.

New concrete jacket has been placed on culvert No 38.

Bridges Nos. 88, 106 and 107 rebuilt, and the Fort Plain footbridge repaired.

Aqueduct No. 10 repaired.

Towing-path graveled and cross-ditched east of bridge No. 78, between aqueducts Nos. 6 and 7; between aqueducts Nos. 7 and 8, east of bridge No. 110, and between bridge No. 110 and lock No. 33.

The 4-arch culvert at Amsterdam cleaned out, also creek from culvert to Mohawk river.

Apron of Schoharie creek dam repaired.

Berme bank west of bridge No. 83 riprapped.

Timber cribs built and filled with stone west of bridge No. 95.

Many bridge approaches on section graveled.

Six new lock gates have been installed in locks Nos. 29, 30 and 34.

Bridges Nos. 96 and 98 rebuilt.

Fender piles at locks Nos. 31 and 32 repaired.

Section No. 4, Erie Canal.

Bridge No. 139 repaired.

Bridges Nos. 140, 142 and 168 rebuilt.

Masonry at lower end of lock No. 41 repointed and grouted.

Towing-path west of bridge No. 133 repaired.

Masonry in bottom of lock No. 44 repointed and grouted.

New platform and tumble gates in lock No. 45, also masonry repointed and grouted, and new concrete wall built against the breast wall.

Docking repaired between bridges Nos. 38 and 39.

Towing-path raised with gravel between locks Nos. 36 and 39, and west of lock No. 39.

Berme bank raised and riprapped between bridges Nos. 131 and 132.

Culvert No. 70 cleaned out and also ditch leading from the culvert to the river.

Towing-path riprapped from east of bridge No. 137 to bridge No. 138.

Many bridge approaches have been graveled.

Break at culvert No. 78, east of Ilion, repaired.

One thousand five hundred lineal feet of ditch through the Albert Keno farm has been cleared out.

Double lock No. 41 repointed and grouted.

Section No. 1, Champlain Canal.

Vertical towing-path wall between locks Nos. 5 and 6 at various places rebuilt.

Bridge Nos. 15, 33, 34 and 50 rebuilt.

Apron of the Troy dam repaired.

Timber docking repaired at the Waterford sidecut; between Wilburs Basin and Coveville; and between bridge No. 62 and north of aqueduct No. 1.

Concrete coping on walls between locks Nos. 3 and 4 and at head of lock No. 4.

Towing-path scraped and cross-ditched at various places.

Six new lock gates installed at Weigh lock, locks Nos. 6 and 10.

Section No. 2, Champlain Canal.

Masonry at lower end of lock No. 11 repointed and grouted, also a concrete cut-off built opposite the lower gates.

Docking repaired on the Glens Falls feeder.

Bridge No. 72 rebuilt.

Sand bars removed between bridges Nos. 100 and 101.

Masonry of waste weir near lock No. 15 repointed and grouted.

One pair of upper gates installed in lock No. 5 of the Glens Falls feeder.

Vertical wall repaired on berme side of Glens Falls feeder, north of the Glens Falls Gas Works.

Bridge No. 7, Glens Falls feeder, rebuilt.

Bottom of Glens Falls feeder repaired one-fourth mile north of bridge No. 10.

Docking repaired between bridges No. 71 and 72; north of bridge No. 78; between bridges Nos. 81 and 82; between bridges Nos. 95 and 97; north of Fort Edward; and between bridges Nos. 5 and 6, Glens Falls feeder.

Towing-path raised with gravel between bridges Nos. 81 and 82; between bridges Nos. 95 and 97, and between bridges Nos. 6 and 7, Glens Falls feeder.

Bars at head of lock No. 14, Glens Falls feeder, removed.

Eel grass in Glens Falls feeder cut.

Slide north of bridge No. 94 repaired.

One thousand five hundred lineal feet of ditching through the Riley farm cleaned.

Three hundred and fifty feet of vertical wall faced with concrete.

Four new lock gates installed in locks Nos. 4 and 13, Glens Falls feeder.

New concrete bottom in lock No. 8, Glens Falls feeder, and lock walls repointed and grouted.

Section No. 3, Champlain Canal.

State scow "Tom & Bob" repaired.

Towing-path scraped and cross-ditched between Fort Ann and Dunhams Basin.

Docking repaired at various places between Dunhams Basin and Fort Ann, and the guard-lock and Whitehall.

Waste weir No. 17 repaired.

Lock No. 18 repointed and grouted.

Special Appropriations.

Repairing bridge over Otsquago creek, Fort Plain, N. Y.

Rebuilding and extending the wall along Steel's creek, in Ilion, N. Y.

Restoring the embankment of Moyer creek, Frankfort, N. Y.

During the past year there has been made at and furnished from the State shops, at Cohoes, and distributed to the different sections, manufactured material representing money in value as follows:

Section 1, Erie Canal.

Lock gates, 6 upper and 4 lower	$1,180 00
Two toe posts for lower gates	48 00
Lock gate valves, 23	207 00
White paint	6 25
Wrought-iron of all kinds, 12,183 lbs	730 98
Cast steel, cold chisels and drills	11 20
Blacksmith	77 75
Cast-iron of all kinds, 4,586 lbs	183 44
Heel post, spliced	12 00
Timber of all kinds, 2,744 feet	116 62
Pike hooks	8 80
Labor	149 80
Pike poles	240 00
Wooden pins, 200	4 00
Steel wrench	1 00
Total	$2,976 84

Section 2, Erie Canal.

Lower and upper toe posts for gates	$204 00
Wrought iron of all kinds, 6,239 lbs	374 34
Cast iron of all kinds, 290 lbs	11 60
Blacksmith	25 50
Labor	39 35
Lock gate valves, 22	198 00
Wooden pins, 100	2 00
One steel wrench	1 00
Pike poles	60 00
One lower gate	130 00
Canvas	42 00

Two feeder gates, complete	$300 00
One new State scow complete	1,800 00
Total	$3,187 79

Section 3, Erie Canal.

Lock gates, 2 upper and 6 lower	$1,000 00
Wrought-iron of all kinds, 9,264 lbs.	555 84
Cast-iron of all kinds, 2,320 lbs	92 80
Lock gate valves, 30	270 00
Wooden pins, 100	2 00
Canvas	105 00
Labor	48 50
Pike poles	60 00
Total	$2,134 14

Section 4, Erie Canal.

Lock gates, 8 lower and 7 upper	$1,790 00
Safety gate diaphragm	3 50
Turn buckles	11 60
Wrought-iron of all kinds, 11,552 lbs	693 12
Cast-iron of all kinds, 7,440 lbs	297 60
Lumber and timber of all kinds, 22,508 feet	971 46
Lock gate valves, 20	180 00
Canvas	128 38
Paint	3 00
Pike poles	60 00
Wooden pins, 200	4 00
One gasolene pump, complete	250 00
One wrench	2 00
Labor	398 50
	$4,793 16

Section 1, Champlain Canal.

Lock gates, 2 upper and 8 lower	$1,260 00
Lock gate valves, 25	225 00
Wrought-iron of all kinds, 7,574 lbs	454 44
Cast-iron of all kinds, 2,766 lbs	110 64
Blacksmith	46 50
Timber and lumber of all kinds, 10,513 ft	411 15
Packing	2 30
Labor	40 50
Pike poles	60 00
	$2,610 53

Section 2, Champlain Canal.

Lock gates, 4 upper	$440 00
Pike poles	60 00
Lock gate valves, 8	72 00
Wrought-iron of all kinds, 3,578 lbs	214 68
Cast-iron of all kinds, 740 lbs	29 60
One lock shovel	5 00
One gasolene pump	250 00
	$1,071 28

Section 3, Champlain Canal.

Wrought-iron of all kinds, 430 lbs	$25 80
Pike poles	60 00
	$85 80

State Dredge No. 1.

Wrought-iron of all kinds, 421 lbs	$25 26
Cast steel	2 40
Blacksmith	7 50

Brooms	$3 30
Dippers	20
Labor	2 25
Kerosene oil	50
Timber	5 00
Linseed oil	4 00
Three pails	1 50
	$51 91

Tug B. B. Odell, Jr.

Wrought-iron	$0 36
Cast-steel	30
Blacksmith	3 00
Linseed oil	5 60
Brooms	1 20
Rope	30 20
Blankets	4 50
Wrench	1 00
Propeller blades	12 00
Lanterns	3 00
Kerosene oil	40
White lead	7 00
Pipe and plumbing	37 83
Machine work	10 58
One deck box for oil lamps	9 96
One steel wrench	60
One mat	1 00
Total	$128 53

Tug George W. Aldridge.

Wrought-iron	$2 22
Blacksmith	1 50
Timber, 125 feet	3 75
Rope	25 00

Brooms	$2 70
One deck box for oil lamps	9 96
Moulding	75
Two pails	1 00
Linseed oil	4 00
One mat	1 00
Labor	18 00
White lead	21 00
Dippers	20
Fenders, 7	7 00
Total	$98 08

State Dredge No. 3.

Wrought-iron of all kinds	$13 38
Boiled oil	4 00
White lead	3 75
Spruce flooring	12 00
Brooms	2 40
Pine ceiling	2 00
Rope	36 80
Blacksmith	4 50
Hemlock lumber	3 30
Pails, 2	1 00
Canvas	20 16
Labor	84 00
Wrenches, 4	3 50
Gray paint	12 50
Hardware	5 00
White oak	4 50
Blinds for house boat, 4	7 00
Red paint	5 00
Total	$224 79

Steam Pump Boat.

Rebuilding hull with new cabin	$819 69
Lumber and timber, all kinds, 2,884 feet	118 72
Machine work on boiler and engine	13 69
Total	$952 10

All buildings including lumber sheds, shop, fences and roof were painted at a cost of	$500 00

The following are the amounts distributed on the Eastern Division from the State shops at Cohoes, N. Y.

Section 1, Erie canal	$2,976 84
Section 2, Erie canal	3,187 79
Section 3, Erie canal	2,134 14
Section 4, Erie canal	4,793 16
Section 1, Champlain canal	2,610 53
Section 2, Champlain canal	1,071 28
Section 3, Champlain canal	85 80
State Dredge No. 1	51 91
State Dredge No. 3	224 79
Tug B. B. Odell, Jr.	128 53
Tug George W. Aldridge	98 08
Steam pump boat	952 10
Cohoes State shops	500 00
Total	$18,814 95

Financial tables showing ordinary expenditures made from October 1, 1909, to September 30, 1910, are herewith attached.

DAVID H. LEWIS,

Assistant Superintendent.

DETAILED STATEMENT *of expenditures on the Eastern Division of the Canals, by David H. Lewis, Assistant Superintendent of Public Works, from October 1, 1909, to September 30, 1910, both inclusive.*

FOR WHAT EXPENDED.	Office.	Division.	ERIE CANAL.				CHAMPLAIN CANAL.		
			Section 1.	Section 2.	Section 3.	Section 4.	Section 1.	Section 2.	Section 3.
Blacksmithing				$74 01	$5 83	$55 68	$3 40	$23 22	$56 50
Burying dead animals				6 00					
Clerk, salary of	$1,600 00								
Cement			$101 60				101 60	140 80	
Coal, all uses		$1,662 24	635 95	488 84	77 23	81 25	268 75	70 20	117 33
Hardware, iron castings, etc		3,073 08	271 42	707 14	279 49	168 25	133 09	144 38	265 37
Lumber and timber (Cohoes shop)		3,921 50							
Lumber and timber, for sections			6,279 41	4,834 01	3,109 15	2,631 21	2,974 03	2,122 19	1,414 43
Labor and team work		11,645 94	3,415 21	11,551 20	7,343 13	3,200 63	2,002 09	4,086 24	907 73
Labor, skilled (Cohoes shop)		13,538 76							
Labor on tugs, dredges and scows		3,198 27	2,897 80	837 89		49 62	2,954 39	297 47	564 93
Merchandise, general	10 50	1,449 94	177 79	74 43	134 56	27 74	45 91	75 85	41 47
Oil for locks			288 00	108 00	84 00	132 00	132 00	204 00	96 00
Paints, painting, oil, etc		498 45	1,533 90	1,406 39	825 48	900 21	808 94	1,112 64	411 59
Postage	80 00								
Repairs to tugs, dredges and scows		1,426 67		58 76				28 78	371 50
Rent, office									60 00
Ropes, lines, etc		565 97	97 73	56 42	133 72	159 36	50 37		29 83
Supplies to tugs, dredges and scows		14 91							
Stationery, printing, etc		17 15	50 10	27 10	43 87	33 75			
Stenographer and typewriter	900 00								
Sand, gravel and clay				13 80		5 50			
Stone									
Telephone and telegraph service	520 12	277 05	28 25	184 75	130 12	54 37	60 52	80 45	69 90
Transportation, freight and express		134 34	20 59	69 10	70 24	35 19	16 70	42 93	89 07
Towing		60 00							
Total	$3,110 62	$11,484 27	$15,797 75	$20,497 87	$12,236 82	$7,534 76	$9,551 79	$8,429 15	$4,192 65
Grand Total									$122,835 68

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on the line of the canal under the charge of Jacob M. Grass, superintendent of repairs for section* 1 *of Erie canal during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	24	....
Lock-gates	186	....
Aqueducts	1	....
Waste-weirs	7	....
Culverts	16	....
Weigh-locks	2	....
Farm bridges (wood)	6	....
Farm bridges (iron)	5	....
Road bridges (wood)	4	....
Road bridges (iron)	22	$802 10
Tow-path bridges (wood)	2	....
Tow-path bridges (iron)	2	....
State scows	2	....
Ice breakers	1	....
Under water excavators	2	....
Lock-houses	6	....
Work-shops	1	....
Watch-houses	24	....
Store-houses	2	....
Timber-sheds	1	....
Cleaning out bottom of canal during spring repairs	....	550 00
Dams (feet, 1,600)	1	....
Slope wall	....	920 25
Watching canal	....	270 00
Other work of consequence which does not come under any of the above heads, viz:		
Water and bridge watch	....	230 00
Disbursing clerk	....	375 00
Total	....	$3,147 35

REPAIRS AND IMPROVEMENTS.

Wherever required repairs have been made to all locks on the section.

All locks, lock houses and bridges have been painted on this section.

Nearly 2,000 lineal feet of new docking has been built on the section.

The weeds and brush along the banks have been cut and burned this season.

All bridges have been repaired and replanked whenever required.

J. M. GRASS,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each. on the line of the canal under the charge of James Scanlon, superintendent of repairs for section 2 of Erie canal, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of repairs of old, etc.	Total expenditures.
Locks	9	$679 24	$679 24
Lock tending (Exclusive of oil)	......	2,295 00	2,295 00
Lock-gates	74	....	....
Aqueducts	3	....	....
Waste-weirs	2	....	....
Culverts	18	....	....
Farm bridges (wood)	14	413 36	413 36
Farm bridges (iron)	1		
Road bridges (wood)	18		
Road bridges (iron)	10		
Towing path (wood)	1		
Towing path (iron)	1		
Feeder bridge (wood)	2		
State scows	3	90 00	90 00
Ice breakers	2	....	....
Lock-houses	3	....	....
Work-shops	1	....	....
Watch-houses	11	....	....
Store-houses	2	....	....

ANNUAL REPORT, *showing the name and number of structures or works on section* 2 — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of repairs of old, etc.	Total expenditures.
Raising and repairing towing-path and berme bank, not including repairs on slope wall...........	......	$430 50	$430 50
Watching canal..................	......	395 00	395 00
Other works of consequence which do not come under any of the above heads, viz:			
Watching State-houses...........	......	270 00	270 00
Bottoming out and repairing walls.	......	1,103 50	1,103 50
Publishing and filing abstract.....	......	3 91	3 91
Disbursing clerk................	......	135 00	135 00
Single team.....................	......	50 00	50 00
Foreman........................	......	75 00	75 00
Patrolman	......	75 00	75 00
Total......................	......	....	$6,015 51

REPAIRS AND IMPROVEMENTS.

In connection with the annexed statement of expenditures, I would respectfully report various improvements as follows:

The placing of seven new lock gates in Locks Nos. 21 and 22.

Entire new trunk for one span in the Upper Mohawk aqueduct and the placing of new ice fender timbers on the aqueduct piers.

Bridges Nos. 55 and 63 were replaced with entirely new bridge structures.

At a point 300 feet easterly from Bridge No. 76, a section of triple lap sheet piling was driven at the toe of the slope wall for a distance of 300 feet and concrete slope wall and concrete veneer bottom placed for the same distance, making this portion of the Nine-mile level, which has heretofore caused much trouble, practically tight.

The high towing-path embankment west of Lock No. 24 which was greatly damaged by ice the past spring has been substantially reinforced at various locations with riprap and timber cribs filled with stone.

The towing-path has been improved at all points on section where necessary by raising with gravel, grading with scraper and cross ditching.

All iron bridges were thoroughly scraped and painted. All wooden bridges and other wooden structures belonging to the State were painted.

All weeds have been cut and ditches opened where necessary.

Trees, brush, etc., on the towing-path banks within the blue line have been entirely removed and burned between Lock No. 27 and Schenectady.

Water on all levels has been kept at proper height and navigation maintained throughout the season without any interruptions.

A very serious leak developed on July 12th through the high towing-path bank easterly from Bridge No. 65, and a very serious break in the canal was only avoided by the prompt action of State employees in making repairs.

JAMES SCANLON,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 3 of the Erie canal, under the charge of Oliver Hurst, superintendent of repairs, during the 365 days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	7	$354 30
Lock-gates	28	....
Aqueducts	7	....
Waste-weirs	10	....
Culverts	30	....
Farm bridges (wood)	47	116 40
Lift bridges (iron)	3	....
Road bridges (iron)	10	....
State scows	5	88 50
Ice breakers	2	....
Lock-houses	7	....
Work-shops	1	....

ANNUAL REPORT, *showing the name and number of structures or works on section 3* — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Watch-houses	1	....
Store-houses	2	....
Cleaning out bottom of canal during spring repairs	....	$484 90
Slope wall	....	200 00
Disbursing clerk	....	75 00
Single rig	....	25 00
Shop watch	....	128 00
Total	....	$1,472 10

REPAIRS AND IMPROVEMENTS.

All locks have been repaired and kept in first-class condition during the season.

Bridges have been repaired and repainted and new guard rails built where necessary.

One thousand feet of new docking, two sticks high, has been built.

The towing-path has been reinforced by cribbing and rip-rapping with stone for a distance of 700 feet west of Bridge No. 95. The inner bank of the towing-path has been repaired by the relaying of wash wall at a point of water height and up.

All bridge approaches have been repaired and graveled.

Five miles of towing-path has been improved by raising with gravel from 6 to 10 inches.

All cross-ditches on towing-path have been kept open and new ones made where necessary.

The Schoharie creek dam has been repaired by replacing three hundred pieces of new timber and calking the upper side of the dam with gravel.

There have been no breaks or serious leaks and navigation has not been interfered with during the past year.

The water has at all times been maintained at a normal height.

Three new farm bridges have been built; two sets of new lock gates installed and the bridge of the towing-path over aqueduct No. 8 has been rebuilt.

All the aqueducts have been calked and repaired and kept in good condition.

OLIVER HURST,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 4 of the Erie canal, under the charge of Charles Wallace, superintendent of repairs, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	11	$496 00
Lock-gates	88	
Aqueducts	5	
Waste-weirs	7	
Culverts	6	
Farm bridges (wood)	48	
Farm bridges (iron)		
State scows	4	80 00
Ice breakers	2	
Lock-houses	4	
Work-shops	2	
Watch-houses	11	
Cleaning out bottom of canal during spring repairs		539 00
Cleaning out aqueducts		98 75
Repairs to slope and vertical walls		125 10
Other work of consequence which does not come under any of the above heads, viz:		
Feeder tender		50 00
Shop Watch		35 00
Disbursing clerk		60 00
Single team		25 00
Total		$1,508 75

CHARLES WALLACE,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section* 1 *of Champlain canal, under charge of John Richmond, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	11	....
Lock-tending	....	$8,528 82
Dams	3	....
Weigh-lock tending	....	879 12
Aqueduct	1	....
Lock-gates	44	....
Waste-weirs	10	....
Culverts	7	....
Weigh-locks	1	....
Tow path bridge	1	....
Farm bridges (wood)	24	....
Road bridges (wood)	22	....
Farm bridges (iron)	3	....
Road bridges (iron)	16	....
Waste-weir bridges	10	....
Disbursing clerk	....	480 00
Bank-watch and horse	....	853 22
Bridge tender	....	847 74
Carpenter, etc	....	2,754 75
State scows	3	....
Collector, office	1	....
Ice breakers	3	....
Spillways	1	....
Lock-houses	7	....
Store-houses	1	....
Single team	....	316 00
Raising and repairing tow-path	....	2,737 17
Cleaning prism canal	....	781 25
Watching canal	....	2,352 01
Publishing abstract	....	29 55
Filing abstract	....	3 72
Painting State scows	....	66 38
Slope wall	....	188 25
Total	....	$20,817 98

REPAIRS AND IMPROVEMENTS.

LOCKS.

During spring repairs all locks were overhauled, connecting rods straightened, new bolts put in where needed and minor repairs made to all locks on section.

BRIDGES.

During the season bridges all along section have been overhauled, new needle beams put in and approaches to several repaired and put in good condition.

DOCKING.

Old dock sticks were taken out and new ones put in at different points all along section.

FEEDERS.

During spring repairs all feeders were overhauled, repairs made where necessary and cleaned out.

WASTE WEIRS.

All waste weirs thoroughly overhauled, pointed and repaired where necessary and cleaned.

PRISM OF CANAL.

During spring cleaning bars were removed and various places all along section and the prism put in good shape.

STATE SCOWS.

The "Timothy L. Woodruff," "Margaret G. Walsh" and "Charles H. Sarles" were thoroughly overhauled, caulked and painted.

CUTTING BRUSH.

During the season all weeds, brush, etc., were cut, piled and burned.

DREDGING.

The State Dredge was used to good advantage in cleaning out Guard Lock No. 4 and at different places along the section.

TOW-PATH.

The tow-path has been kept in excellent condition by the State boat crews, rolling, scraping and strengthening the banks.

VERTICAL WALL.

Vertical and slope walls were repaired at different points all along the section.

JOHN RICHMOND,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 2 of the Champlain canal, under the charge of Patrick O'Grady, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Locks	19	......	$284 83	$284 83
Lock-tending (exclusive of oil)	....	......	12,638 56	12,638 56
Lock-gates	64	......	434 37	434 37
Aqueducts	3	......	....	....
Waste-weirs	3	......	102 50	102 50
Culverts	9	......	....	....
Sluices	8	......	234 65	234 65
Farm bridges (wood)	11	......	40 68	40 68
Road bridges (wood)	27	......	654 63	654 63
Road bridges (iron)	9	......	....	....
Tow-path bridges (wood)	5	......	....	....
Foot bridges	21	90 50	....	90 50
State scows	2	......	50 00	50 00
Small boats	1	......	....	....
Ice breakers	2	......	....	....
Lock-houses	16	......	31 50	31 50
Work-shops	1	......	46 00	46 00
Watch-houses	1	......	....	....
Timber-sheds	3	......	....	....
Piling machines	1	......	....	....
Raising and repairing tow-path and berme bank not including repairs to slope walls	....	......	3,482 12	3,482 12

ANNUAL REPORT, *showing the name and number of structures or works, on section 2* — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Cleaning out bottom of canal during spring repairs	....	......	$777 00	$777 00
Dams (feet, 900)	1	......	57 50	57 50
Slope wall	....	......	545 50	545 50
Docking	....	......	580 05	580 05
Repairs of breaches	....	......	443 90	443 90
Watching canal	....	......	2,919 90	2,919 90
Other miscellaneous expenditures	....	......	520 58	520 58
Other work of consequence which does not come under any of the above heads, viz:				
Foreman	....	......	640 50	640 50
Disbursing clerk	....	......	480 00	480 00
Publishing and filing	....	......	52 32	52 32
Total	....	......	....	$25,107 59

REPAIRS AND IMPROVEMENTS.

Two new gates have been inserted in Lock No. 5, Glens Falls feeder; five new balance beams have been placed on gates; all the plank taken out of bottom of Lock No. 9, Glens Falls feeder; the space between the foundation timbers cleaned out, and a new concrete bottom six inches thick put in place.

The lock houses have all been put in good repair and painted. The large house at the guard lock was newly shingled and painted.

Bridges No. 7, Glens Falls feeder and No. 72, Champlain canal, were newly built during the present season. All the bridges have been put in good repair and painted.

At the head of Lock No. 14 and the Glens Falls feeder, the channel in the pond had become so filled with silt that at low water it was almost impossible to get boats through. That has been cleaned with a scraper, and the silt dumped in deep water. There is now seven feet of water, and boats pass without any trouble.

During the past winter, the bottom of the Glens Falls feeder, from Bridge No. 10 to waste weir No. 1, a distance of 1,300 lineal feet, was excavated, cleaned out, and a concrete bottom and side walls put in place, which has been a great saving to water this season. There are still great crevices in the rocks from Shermantown to the Glens Falls Portland Cement Works, a distance of 1,500 lineal feet, where there is a loss of water, also damages by water to the Sherman lime kilns.

RECOMMENDATION.

I most respectfully recommend that the Glens Falls feeder dam be thoroughly inspected.

PATRICK O'GRADY,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 3 of the Champlain canal, under the charge of George Neddo, superintendent of repairs, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Locks	7	......	$472 10	$472 10
Lock-tending (exclusive of oil)	....	......	....	5,422 93
Lock-gates	16	......	110 00	110 00
Waste-weirs	8	......	99 00	99 00
Culverts and vertical walls	3	......	279 75	279 75
Farm bridges (wood)	16	......	....	....
Farm bridges (iron)	7	......	....	....
Road bridges (wood)	5	$198 00	635 00	833 00
Road bridges (iron)	2	......	....	....
Tow-path bridges (wood)	2	......	....	....
Tow-path bridges (iron)	2	......	....	....
State scows	2	......	....	....

ANNUAL REPORT, *showing the name and number of structures or works, on section 3* — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Ice breakers	2	......	....	....
Lock-houses	4	......	$77 00	$77 00
Work-shops	1	......	....	....
Watch-houses	1	......	....	....
Raising and repairing tow-path and berme bank not including repairs to slope walls	....	......	2,523 66	2,523 66
Cleaning out bottom of canal during spring repairs	....	......	....	1,091 50
Dams (feet, 75)	1	......	....	....
Docking	....	......	....	881 00
Watching canal	....	......	....	2,144 11
Other miscellaneous expenditures, publishing and filing abstracts	....	......	....	31 14
Other work of consequence which does not come under any of the above heads, viz:				
Scraping tow-path	....	......	....	80 00
Tending waste-weirs, cleaning bridges	....	......	....	140 00
Inspecting canal, single horse	....	......	....	232 31
Clerical work, disbursing clerk	....	......	....	480 00
Total	....	......	....	$14,897 50

REPAIRS AND IMPROVEMENTS.

The gates were replanked and a new balance beam was put in at Lock 20 last spring. The gates in the Fort Ann locks were replanked and two new balance beams were put in. A new balance beam was put in at Lock 21. This season a leak at Lock 18 was stopped by excavating at the side of the east wall and puddling.

A new bridge (No. 114) was built and erected this season. Needle beams were put in and planking was done on the other bridges where such repairs were needed. All bridges on the section were painted.

The carpenters' scow was rebuilt, painted, and put in good condition in the spring.

Two thousand feet of new docking has been built on the Twelve-mile level. Repairs have been made to the docking at points along the Five-mile level.

One hundred feet of stone wall has been rebuilt in the outlet to waste wier No. 18.

The tow-path has been scraped and graveled along the Twelve-mile level and old docking on this level has been filled in.

Leaks have been promptly checked and there has been no hindrance to navigation during the season.

Three sunken boats were raised promptly with no delay to traffic.

RECOMMENDATIONS.

A new bottom should be placed in Lock 18 before another season. More chipping is also needed in this lock.

GEO. NEDDO,
Superintendent.

MIDDLE DIVISION.

Syracuse, N. Y., *January* 1, 1911.

Hon. F. C. Stevens, *Superintendent of Public Works, Albany, N. Y.:*

Dear Sir.— The annual report for the Middle Division of the New York State canals is herewith submitted.

The Middle Division comprises three sections of the Erie canal, 5, 6 and 7, covering about 97 miles in distance; the Black River canal, covering a distance of 78 miles; the Oswego canal, covering 38 miles in distance, and the Cayuga and Seneca canal, covering a distance of 23 miles of canal proper. While Cayuga and Seneca lakes are not properly or legally portions of the canal system of the State, both are navigated to quite an extent by canal boats, and at either end are inlets and outlets designed and maintained by State authority for the benefit and convenience of canal traffic.

The aggregate length of navigable canals and rivers upon this division, including 67 miles of side-cuts and navigable feeders, is 303 miles. There are 159 locks, 23 aqueducts, 137 culverts, 148 waste weirs and spillways, 42 dams, 455 bridges, 6 section and 1 division repair shops.

The beginning of the year found the reservoirs in an unusually low condition on account of the extensive drought of the previous year, and immediate steps were taken to husband the resources of all the reservoirs.

Even with this precaution, three of the reservoirs of the southern reservoir system failed to fill to the crest of the dams.

With the opening of navigation, the strictest economy was exercised in the feeding of water, and it was owing to this that it was possible to maintain navigation to the end of the season.

The work of making repairs to the structures and banks of the canals on this division has been carried on along the same lines as the year previous, and the improved condition of the canals show that the work was done in a competent and efficient manner.

About eleven o'clock on the morning of May 10th, four days before the date set for the official opening of the canals and just as the water in the Syracuse level had reached its normal height, a break was discovered in the berme wall over the culvert which carries the canal across Harbor brook, in the westerly section of the city of Syracuse.

The drawing of water from the Syracuse level was started immediately and the work of making the necessary repairs begun at once.

It was very easily determined that the break was caused by the construction of a new intercepting sewer underneath and across the canal at this point, which work was done by the city of Syracuse. The city authorities recognized their responsibility for the break at once and consequently the expense of making the necessary repairs was borne by the city. The work was finished May 19th and navigation opened.

There was no other detention to navigation on this division during the past year.

Following you will find a detailed summary of repairs made during the year:

GENERAL IMPROVEMENTS ON THE MIDDLE DIVISION OF THE NEW YORK STATE CANALS, FROM JANUARY 1, 1910, TO JANUARY 1, 1911.

Middle Division.

Building a new stone and gravel scow.
Building new power and gravel boat.

Section 5, Erie Canal.

Repairs to lift bridges in city of Utica.
Repairs to lift bridge at Canastota.
Repairs to Bridge No. 24.
Repairs to Madison street bridge at Rome.
Repairs to Doxtater avenue bridge at Rome.

Repairs to Hutchins bridge at Rome.

Building new State scow.

Repairs to bulkhead on Oneida feeder.

Repairs to Chenango feeder spillway.

Building new foot bridge east of Culvert No. 35 near Durhamville.

Building movable bridge over Oneida feeder at Durhamville.

Repairs to leak in Durhamville aqueduct.

Repointing spillway at Eaton brook reservoir.

Strengthening bank of Kingsley brook feeder.

Rebuilding Shepley's bridge and repairing abutments.

Rebuilding waste weir on Madison feeder.

Rebuilding spillway of Bradley brook feeder.

Cleaning eel grass from Bradley brook, Chenango, Madison and Kingsley brook feeders.

Raised the east bank of Bradley brook feeder between spillway and highway for a distance of 750 feet.

Dredged out Oneida feeder from Durhamville to Oneida.

Repairs to spillway on Oneida creek at Durhamville.

Leveling off both banks of Oneida feeder of the earth dredged from the bed.

Raising, scraping, back ditching and graveling tow-path.

Painting all bridges and other structures.

Repairs to leak in the berme bank of Erie canal just west of Culvert No. 16 near Rome.

Repairs to Oriskany dam.

Construction of new bridge over inlet feeder at Eaton brook reservoir.

Cleaning out State ditches.

Section 6, Erie Canal.

Repairs to lift bridges, city of Syracuse.

Repairs to Fayetteville aqueduct.

Repairs to Camillus aqueduct.

Repairs to Locks Nos. 47, 48, 49 and 50.

Strengthening tow-path bank east of Hedson's landing.

Repairs to break in canal near Harbor brook, intercepting sewer.

Repairs to vertical wall on Level 1, Oswego canal, at Syracuse.

Raising, scraping, back ditching and graveling towing-path between Syracuse and Pool's brook.

Repairs to tug "W. E. Cleary," damaged at West Genesee street bridge.

Cleaning out under Canasaraga culvert and Chittenango aqueduct.

Strengthening berme bank between Fayetteville and Pool's brook.

Strengthening tow-path bank east of Hedson's landing and the bank just west of Chittenango.

Painting all bridges and other structures.

Cleaning out the culvert under the Erie canal at Canastota.

Repointing masonry work at Jamesville reservoir dam.

Cleaning out State ditches.

Section 7, Erie Canal.

Rebuilding Weedsport waste weir.

Repairs to Carpenter brook aqueduct.

Repairs to Locks Nos. 51 and 52.

Raising, scraping, back ditching and graveling towing-path between Camillus and Memphis.

Painting all bridges and other structures.

Oswego Canal.

Putting in new bottom and making general repairs to Caughdenoy lock.

Strengthening berme bank at Baldwinsville.

Repairs to Oak Orchard dam.

Cayuga and Seneca Canal.

Removing stone from bed of canal and replacing same along the front angle of towing-path on the Montezuma level.

Building concrete cut-off wall at Lock No. 10 to prevent leakage.

Putting new bottom in Locks Nos. 2 and 4.

Putting in new gates and mitre sills in Locks Nos. 2, 3, 4 and 5.

Repairs to Clark or Swift street bridge, Waterloo.

Strengthening Ovid street bridge at Seneca Falls.

Scraping, grading and back ditching tow-path.

Cleaning ditches, culverts and outlets paralleling the Montezuma level.

Raising, scraping, back ditching and graveling towing-path between Seneca Falls and Mud Lock, and between Waterloo and Guard Lock.

Painting all bridges and other structures.

Black River Canal.

Rebuilding the Robert Hill, Beckwith and Benfield bridges.

Repairs to break in towing-path between Locks Nos. 33 and 34.

Replanking Carthage bridge.

Building new concrete abutment and superstructure of Eberts bridge.

Repairs to State house at Woodhull reservoir.

Construction of new bridge to take place of Whittlesey's road bridge.

Lowering spillway at North Lake reservoir.

Rebuilding flume and making other minor repairs, North Lake reservoir.

Repairs to Sand Lake reservoir by repointing dam and rebuilding bridge below dam.

Replanking Carthage bridge.

Repairs to leak in Forestport feeder.

Special.

Dynamiting ice jam at Herkimer.

Repairs to Black River canal between Rome and Boonville.

Repairs to bridge over the Chemung canal at Watkins.

Repairs to Howland's Island bridge.

Repairs to highway adjacent to Contract No. 5, Barge canal.

Repairs to State dams and locks in the Saranac river.

Improvement of the Oriskany creek feeder in the town of Kirkland, Oneida county.

Constructing new bridge of concrete over State feeder at Cedar street, city of Oneida.

A financial table showing the total expenditures for ordinary repairs during the fiscal year is appended hereto.

CHAS. C. BARRETT,
Assistant Superintendent.

DETAILED STATEMENT *of expenditures on the Middle Division of the canals, by Chas. C. Barrett, Assistant Superintendent of Public Works, from October* 1, 1909, *to September* 30, 1910, *both inclusive.*

FOR WHAT EXPENDED.	ERIE CANAL.				Oswego canal.	Cayuga and Seneca canal.	Black River Canal.	Office expenses.	Totals.
	Section No. 5.	Section No. 6.	Section No. 7.	Middle division.					
Clerks and stenographer	....	....	....	....	....	....	....	$3,727 69	$3,727 69
Coal, oil, gasoline, hay, oats, etc	$366 60	$641 34	$68 76	$975 50	$31 00	$226 27	$32 44	....	2,341 91
Express, freight, telephone, etc	210 80	87 89	45 89	221 90	86 39	89 44	149 98	552 99	1,445 28
Equipment	506 22	208 15	15 50	6,094 54	15 00	3 81	9 00	....	6,852 22
Hardware, rubber goods etc	1,786 45	1,946 08	623 51	2,815 28	391 60	725 68	1,166 21	....	9,454 81
Heat, lighting, power, stationery, et	....	140 92	....	306 64	55 75	5 86	44 00	463 51	1,016 68
Labor and team work	16,173 97	9,255 81	4,296 33	22,505 18	1,008 51	7,306 35	9,002 68	....	69,548 83
Lumber	2,310 90	2,376 43	1,596 52	4,436 17	829 88	2,824 39	5,832 00	....	20,206 29
Mechanics' labor and material	544 11	849 26	35 52	1,122 55	282 41	149 27	44 15	....	3,027 27
Paint, oil, lead, etc	925 01	840 58	404 54	172 53	348 57	374 68	49 55	....	3,115 46
Reservoir and feeder tending	1,164 27	1,092 50	182 50	....	....	....	1,219 99	....	3,659 26
Stone, sand, lime, cement, etc	325 16	1,003 06	24 18	30 84	124 71	190 40	757 39	....	2,455 74
Totals	$24,313 49	$18,442 02	$7,293 25	$38,681 13	$3,173 82	$11,896 15	$18,307 39	$4,744 19	$126,851 44

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 5 of the Erie canal, under the charge of D. F. Brietenstein, superintendent of repairs, during the 365 days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	1	$51 75
Lock-tending (exclusive of oil)	....	1,678 06
Lock-gates	8	....
Aqueducts	3	193 55
Waste-weirs	4	....
Culverts	38	152 20
Road bridges (iron)	86	3,311 66
State scows	2	....
Small boats	1	....
Ice breakers	1	....
Lock-houses	1	....
Work-shops	2	....
Watch-houses	1	....
Store-houses	1	....
Timber-sheds	1	....
Raising and repairing tow-path and berme bank not including repairs to slope walls.	....	609 50
Cleaning out bottom of canal during spring repairs	....	1,065 25
Slope and vertical walls	....	855 37
Docking	....	1,516 40
Watching canal	....	3,106 08
Other work of consequence which does not come under any of the above heads, viz:		
Piling lumber	....	36 96
Care of and repairs to lift bridges	....	915 00
Team for superintendent going over section.	....	196 35
Tending Hotel street lift-bridge	....	1,869 24
Publishing abstract	....	36 90
Disbursing clerk	....	562 50
Snubbing posts	....	73 48
Placing barriers to prevent driving on tow-path	....	10 50
Mowing grass and weeds	....	429 28
Cleaning office	....	84 00
Total	....	$16,754 03

REPAIRS AND IMPROVEMENTS.

Bridges Nos. 4, 7, 8, 9, 10, 11, 12 have been replanked, and all other bridges along the section have been inspected and repairs to same made when needed, all lift bridges have been taken care of and repairs to machinery at different times.

Culverts.

Have been cleaned out and minor repairs made to same.

Docking.

Minor repairs to same made at different points along section.

Locks.

Repairs have been made to lock houses, and same has been painted.

State Shop.

Has been painted and reshingled.

Grass and weeds have been cut once, along section and along Oriskany and Oneida feeders.

Aqueducts.

Minor repairs made to Oriskany aqueduct.

Tow-path and berme banks, holes have been filled up and same graded at different points with gravel and slag.

Snubbing posts have been set at different points along section where most needful.

Remarks.

The levels have at all times been maintained at their normal height, and navigation has not been interfered with at any time during the season.

D. F. BREITENSTEIN,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 6 of the Erie canal, under the charge of E. J. Clark, superintendent of repairs, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	8	....
Lock-tending (exclusive of oil)	....	$8,922 67
Lock-gates	50	948 37
Aqueducts	4	70 94
Waste-weirs	8	191 75
Culverts	26	....
Weigh-locks	1	....
Farm bridges (wood)	6	....
Road bridges (wood)	13	....
Road bridges (iron)	39	1,678 17
Tow-path bridges (wood)	2	....
Tow-path bridges (iron)	3	....
State scows	2	....
Lock-houses	8	21 00
Work-shops	1	....
Store-houses	1	....
Timber-sheds	1	....
Raising and repairing tow-path and berme bank not including repairs to slope walls.		352 96
Cleaning out bottom of canal during spring repairs	....	900 00
Spillways	....	20 80
Slope wall	....	2,642 34
Stopping leaks	....	382 53
Watching canal	....	3,057 10
Other work of consequence which does not come under any of the above heads, viz:		
Cutting weeds and brush on section	....	934 98
Stacking lumber at State yard	....	177 74
Removing traction engine from Stearns Farm bridge (60 mile level)	....	16 97
Cement sidewalks	....	25 00
Closing canal after close of navigation 1909.	....	39 96
New bulkheads Camillus feeder and Lock No. 50	....	207 34
Safe guarding canal near the Empire State Mills, Syracuse level	....	41 47
Publishing and filing	....	43 62
Disbursing clerk	....	900 00
Team for superintendent over section	....	150 00
Total	....	$21,725 71

REPAIRS AND IMPROVEMENTS.

Previous to the opening of navigation all rubbish was removed from the canal bed through the city of Syracuse and drawn away, the walls were relaid, and bars removed from underneath all bridges. As the required depth of water has been maintained on this section without difficulty no delays have been reported by boatmen from grounding.

A new packet dock has been built between Willow street and the New York Central railroad bridge, the channel dredged and all packet boats formerly occupying the docks between Salina and Clinton street bridges now load and discharge freight at this point, to the great relief of persons doing business in the vicinity of Clinton Square, who have suffered considerable damage from smoke and the delay of traffic arising from the frequent lifting of the hoist bridges for the passage of boats to and fro.

All bridges on this section have been carefully inspected from time to time, repairs made where needed, and all have been painted. Two new bridges have been built, one at Kirkville, No. 72, and the other at Stearns' farm, No. 74.

Two new lock gates have been placed at Lock No. 50.

New balance beams have been placed as follows: Five in Lock No. 49, one in Lock No. 48, three in Lock No. 5.

All operating machinery has been kept in good order.

Weeds and brush have been cut on both sides of the Erie and Oswego canals, including feeders.

The tow-path has been kept in excellent condition by scraping and grading at frequent intervals.

More than 3,000 lineal feet of wornout timber docking has been taken out and replaced by concrete, adding to the appearance of the canal and preventing damage to property from the overflow of banks, especially on the mile level, city of Syracuse.

Very little complaint has been made by boatmen as to delay at locks or lift bridges, as it has been our purpose to employ only sober, competent men at these stations. Were they found otherwise after fair trial they have been promptly dismissed and better men substituted.

E. J. CLARK,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section 7 of the Erie canal, under the charge of Albert B. Hallett, superintendent of repairs, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	4	$377 75
Lock-tending (exclusive of oil)		3,302 10
Lock-gates	16	389 06
Aqueducts	5	33 00
Waste-weirs	3	5 50
Culverts	21	
Farm bridges (wood)	3	661 37
Farm bridges (iron)	1	
Road bridges (wood)	10	
Road bridges (iron)	12	
Tow-path bridges (wood)	2	
State scows	2	
Ice breakers	1	
Lock-houses	2	
Work-shops	1	
Tool shed	1	
Raising and repairing tow-path and berme bank not including repairs to slope walls.		2,608 58
Cleaning out bottom of canal during spring repairs		703 63
Dams (feet, 257)	4	8 80
Slope wall		36 96
Docking		258 80
Repairs of breaches		36 56
Watching canal		2,157 64
Other work of consequence which does not come under any of the above heads, viz:		
Disbursing clerk		525 00
Publishing and filing abstract		37 62
Livery for paying off		56 00
Livery for superintendent to go over section		70 00
Mowing weeds		937 87
General repairing at State shop		9 00
Removing eel grass from Owasco feeder		135 90
Ditching		61 94
Repairs to Owasco feeder		79 90
Closing canal		29 17
Total		$12,522 15

REPAIRS AND IMPROVEMENTS.

Stone removed from bottom of canal and wall relaid where necessary from division bridge to Lock 52.

Bar removed from Putman feeder.

From Owasco feeder west, along berme bank to near dry dock the mud was removed.

Snubbing posts were set where necessary.

LOCKS.

Nos. 51-52. The machinery has been thoroughly overhauled and repaired, and both locks have been repointed.

BRIDGES.

Nos. 112, 114, 115, 117, 118, 121 and 123 redecked, and other bridges kept in good repair.

DOCKING.

To the amount of 1,200 feet has been placed on the Weedsport level at Weedsport and Port Byron.

TOWING-PATH.

About three miles of towing-path on Jordan level has been graded with shale, beside what has been done by Middle Division.

OWASCO FEEDER.

About the usual amount of cleaning was done under spring repairs, eel grass mowed, brush cut and burned on bank during season.

CARPENTER'S BROOK.

Bar removed below Carpenter's brook waste weir. Weeds and brush have been cut and burned on both sides of canal the entire length of section.

Locks, bridges, snubbing posts and all buildings on section have been painted.

Navigation has not been interrupted during the season.

A. B. HALLETT,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on the Oswego canal, under the charge of D. S. Burleigh, superintendent of repairs, during the 365 days ended September 30, 1910.*

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Locks	22	......	$829 22	$829 22
Lock-tending (exclusive of oil)	....	......	....	5,837 31
Lock-gates	116	$258 00	105 60	363 60
Aqueducts	1	......	....	....
Waste-weirs	8	......	....	....
Culverts	4	......	....	....
Road bridges (wood)	7	......	....	....
Road bridges (iron)	10	......	4 60	4 60
Tow-path bridges (wood)	4	......	149 08	149 08
State scows	1	......	184 22	184 22
Ice breakers	1	......	....	....
Lock-houses	20	......	....	....
Work-shops	1	......	....	....
Timber-sheds	1	......	....	....
Raising and repairing tow-path and berme bank not including repairs to slope walls	....	......	1,162 77	1,162 77
Dams (feet, 3,371)	....	......	59 09	59 09
Docking	....	......	320 20	320 20
Watching canal	....	......	....	832 75
Other work of consequence which does not come under any of the above heads, viz:				
General repairs	....	......	....	708 89
Publishing abstract	....	......	....	32 10
Filing abstracts	....	......	....	3 72
Disbursing clerk	....	......	....	525 00
Sluices	....	......	46 46	46 46
Balance beams	....	......	13 80	13 80
Snubbing posts	....	13 80	....	13 80
Contingency	....	......	....	3 20
Total	....	......	....	$11,089 81

REPAIRS AND IMPROVEMENTS.

Two new lock gates have been placed at Baldwinsville lock. The Seneca river towing-path has been repaired, so that it is again passable for teams.

The towing-path on Level No. 5 has been repaired and tile sluices put in where the wooden ones had rotted out.

The weeds have been cut the entire length of the canal, and the bushes are being cut.

The lock at Baldwinsville needs repairing, also Locks Nos. 12, 14 and 15 each needs two new gates. The berme wall at Lock No. 14 must be rebuilt this winter. Also the bulkhead on the east end of Battle Island dam must be rebuilt, or a coffer dam placed in front of it.

The exchange bridge at Hinmansville should be repaired this winter, and the draw bridge at Caughdenoy needs a thorough overhauling.

D S. BURLEIGH,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on the Cayuga and Seneca canal, under the charge of O. E. Emens, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Locks	11	......	....	$298 90
Lock-tending (exclusive of oil)	....	......	....	4,964 09
Lock-gates	48	......	....	259 95
Waste-weirs	1	......	....	....
Culverts	9	......	....	....
Farm bridges (wood)	1	$143 60	$432 67	
Road bridges (wood)	7			672 06
Road bridges (iron)	12			576 27
Tow-path bridges (wood)	26			
State scows	1	......	....	....
Lock-houses	3	......	....	....

ANNUAL REPORT, *showing the name and number of structures or works, on the Cayuga and Seneca canal* — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Work-shops	1	......	....	....
Watch-houses	8	......	....	....
Raising and repairing tow-path and berme bank not including repairs to slope walls	....	......	....	$1,451 80
Dams (feet,)	5	......	....	250 62
Docking	....	......	....	314 72
Watching canal	....	......	....	740 01
Other work of consequence which does not come under any of the above heads, viz:				
Light-house keeper	....	......	....	123 33
Disbursing clerk and collector	....	......	....	525 00
Livery for paying off and inspection	....	......	....	161 00
Caring for bridges and guard lock	....	......	....	254 90
Work at State shop and yard	....	......	....	36 50
Removing trees and brush from canal	....	......	....	6 86
Aiding grounded boats	....	......	....	41 48
Cutting weeds	....	......	....	154 23
Publishing abstract	....	......	....	34 80
Repairing State scow	....	......	....	47 02
Total	....	......	....	$10,913 54

REPAIRS AND IMPROVEMENTS.

New sluice boxes installed on tow-path and all tow-path bridges repaired entire length of section.

New concrete coping installed at Locks Nos. 2 and 11.

New balance beams put on several lock gates and all locks repaired.

All bridges wholly or partially replanked.

O. E. EMENS,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on the Black River canal, under the charge of J. A. Fiske, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Locks	113	......	$328 26	$328 26
Lock-tending (exclusive of oil)	....	......	....	13,680. 00
Lock-gates	406	$621 94	32 43	654 37
Aqueducts	6	......	202 60	202 60
Waste-weirs	11	......	27 77	27 77
Culverts	19	......	40 00	40 00
Farm bridges (wood)	36	31 00	228 86	259 86
Farm bridges (iron)	26	......	....	....
Road bridges (wood)	22	175 85	458 52	634 37
Road bridges (iron)	....	......	251 81	251 81
Tow-path bridges (wood)	7	......	....	....
Tow-path bridges (iron)	2	......	....	....
State scows	2	......	23 25	23 25
Lock-houses	54	214 25	....	214 25
Work-shops	2	......	....	....
Watch-houses	3	......	....	....
Store-houses	1	......	....	....
Timber-sheds	1	......	....	....
Piling machines	1	......	....	....
Raising and repairing tow-path and berme bank not including repairs to slope walls	....	......	....	1,189 62
Cleaning out bottom of canal during spring repairs	....	......	....	120 65
Docking	....	240 40	....	240 40
Repairs of breaches	....	......	....	235 32
Watching canal	....	......	....	1,622 50
Other work of consequence which does not come under any of the above heads, viz:				
Disbursing clerk	....	......	....	900 00
Tending Alder creek reservoir	....	......	....	360 00
Tending Delta feeder	....	......	....	55 00

ANNUAL REPORT, *showing the name and number of structures or works, in the Black River canal* — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Cost of new structures.	Cost of repairs of old, etc.	Total expenditures.
Tending Garden St. bridge..	....	......	....	$550 00
Livery for paying off......	....	......	....	316 75
Cleaning superintendent's office..................	....	......	....	42 00
Publishing abstract........	....	......	....	51 02
Building rip rap walls......	....	......	....	154 85
Piling and stacking lumber.	....	......	....	132 00
Raising sunken boats......	....	......	....	113 75
Cutting brush and weeds...	....	......	....	413 70
Loading steam boiler on flat car....................	....	......	....	19 35
General repairs...........	....	......	....	3,649 77
Total...............	....	......	....	$26,483 22

J. A. FISKE,
Superintendent of Repairs

WESTERN DIVISION.

Office of the Assistant Superintendent of Public Works.

Rochester, N. Y., *December* 31, 1910.

Hon. F. C Stevens, *Superintendent of Public Works, Albany, N. Y.:*

Dear Sir.— I present herewith the annual report relative to the Western Division of the canal, for the fiscal year ending September 30, 1910.

In accordance with the respective official notices given thereof, navigation was opened on this division May 15th and closed November 15th.

The location of the Barge canal closely follows the alignment of the Erie canal, from a point about 1.75 miles east of South Greece, to Pendleton, and Tonawanda creek (canalized), from Pendleton to Tonawanda. The greater portion of this route is now covered by the following specified Barge canal contracts: Nos. 60, 61, 62, 9, 64, 66, 67, 40 and 19 as numbered from east to west and aggregating a distance of 69.88 miles. The total distance along the Erie canal between the limits heretofore mentioned is about 74 miles.

With the exception of Barge canal contracts Nos. 62 and 67, on which very little work has been done this season, the Barge canal contractors have progressed the work on all other contracts above mentioned, at various points and throughout the entire season of navigation.

While the dual work pertaining to the maintenance of navigation and its interference by Barge canal operations, has had its conflicts, it is gratifying to state that the normal depth of water required in the canal has been generally maintained throughout the division, and navigation uninterrupted to any serious extent. These results are mostly due to the careful and intelligent inspection of canal banks and other structures, made by the force of bank watch maintained for that purpose. Many serious leaks through banks and culverts were discovered in time to repair them and thus prevent what might have speedily developed into disastrous breaks and washouts. I am of the opinion that at the present time, the canal banks and many other structures connected with the canal, are in better condition than they have been in several years.

EQUIPMENTS.

One Climax road machine has been placed on sections Nos. 8, 9 and 10 respectively, for tow-path grading purposes.

The State shop buildings in Rochester and Buffalo have all been thoroughly painted.

Six flat-bottom rowboats have been built for use on the Western Division in connection with State scows and stop gates.

A storehouse 20 by 30 feet in size has been erected on the berme side of the canal about 1,500 feet west of the Albion swing bridge, and an emergency equipment placed therein, consisting of a steam, piston pile-driver, boiler, double-drum engine, and necessary rollers.

A new pump boat has been constructed for division use and located at Rochester. Length 65 feet, beam 17 feet, engine 10 by 12 inches, and a Scotch marine boiler.

A new derrick boat has been constructed for use on Section No. 11. It has side spuds, portable A frame, 3-drum engine, and with but little change can be used as a clam-shell dredge.

A warehouse 20 by 30 feet in size has been constructed in the State yard in Buffalo, for the storage of cement therein.

Recommendations.

The private telephone line heretofore installed along the canal between Rochester and the Sulphur Spring Guard Lock, has been of great service in the matter of directing canal affairs between the limits mentioned. I recommend that a similar telephone line be installed between Rochester and Clyde for use in the conduct of business pertaining to the management of the canal and its structures.

Extra bank watchmen should be appointed to patrol the banks of the Erie canal in all localities where interfered with by Barge canal operations during the season of navigation.

All stop gates intended to be constructed on the Western Division under Barge canal contracts, should be completed as soon as possible so as to be ready for emergency use.

The following is a list of ordinary and extraordinary repairs made on the Western Division, also of work done under special appropriations. Itemized expenditures for labor and materials furnished on account of these repairs, will be found in the annexed tabulated statement.

ORDINARY REPAIRS.

SECTION NO. 8.

The grass cutter was equipped and eel grass cut and removed from the canal where necessary throughout the section.

Framed and put in new timbers, platform and gates in waste weir No. 1.

Framed and put in new cap stick, platform and gates in waste weir No. 2.

SECTION NO. 9.

Removed old tumble gates and inserted new ones, new platform at Lock No. 62, and built lockers for lock house at Lock No. 62.

Inserted toe posts and new balance beams, replanked gates and repaired middle ground of Lock No. 64. Made stops for gates at Locks Nos. 62, 63, 64 and 65, inserted new gates and water wheel at Lock No. 64, built new bottoms for wheel pits of Locks Nos. 63 and 66, built foot bridge at Lock No. 66 and placed targets at Locks Nos. 62, 63, 64 and 65, and made general repairs to Locks Nos. 62, 63, 64, 65 and 66.

Rebuilt towpath ends of culverts Nos. 28 and 29.

Built new guard rail and replanked towpath along aqueduct in Rochester.

Pointed vertical wall on berme side of canal, between Plymouth avenue and Washington street, to prevent leakage.

Built new bulkheads for Cartersville, Bushnell's Basin and Fairport waste weirs.

Put in new coping where needed, repaired street pavement and relaid crosswalk at Exchange street bridge.

Repaired sidewalks and approaches to bridges Nos. 65, 69 and 88; also West avenue, Caledonia avenue, Lexington avenue and Brockport lift bridges.

New steel cables were placed on Caledonia avenue lift bridge.

Erected bridge tenders' house at bridges Nos. 75 and 83, respectively.

Built 110 feet of cement walk 6 feet in width at approach to Griffith street bridge.

Repaired and replanked bridges Nos. 43, 45, 46, 47, 49, 53, 54, 56, 58, 61, 62, 64, 65, 66, 67, 68, 69, 73, 74, 75, 76, 76½, 77, 79, 82, 85, 86, 87, 88, 89, 90, 95, 98, 101, 103, 104, 105, 106, 108, 111 and 112.

Repaired Allen street, Lyell avenue, Exchange street, West avenue, Lexington avenue, Emerson street, Fitzhugh street, Brighton, Brockport and Fairport lift bridges.

Repaired Brighton bridge pumping station.

Replanked sidewalk and erected hand rail for 162 feet between Exchange street and Irving place.

SECTION No. 10.

Inserted five large and two small lock valves and three gate valves in combined locks at Lockport.

Cut brush and weeds from banks of Tonawanda Creek feeder for its entire length, and burned the same.

Repaired leak in culvert at Morgan's drydock on Barge Canal Contract No. 66.

Blasted rocks in prism of canal, between bridges Nos. 124 and 121 and removed debris from canal.

Opened ditch on north side of canal in the village of Knowlesville to care for seepage from canal.

Constructed a new wooden warehouse 32 by 24 feet in size on the south side of State road, east of bridge No. 165, for storing machinery belonging to the State, consisting of stone crusher, recently purchased and removed from berme bank of canal east of said bridge.

Framing timbers and inserting new gates at Sulphur Springs Guard Lock.

Removing puddling clay at the head of the Sulphur Springs Guard Lock, also framing and placing dam sticks at head of said lock preparatory to removal of old gates and insertion of new ones.

Dredged materials from head of Sulphur Springs Guard Lock, and removed dam sticks in order to open lock gates.

SECTION NO. 11.

Dredging was performed in the canal at the following places in Buffalo: Between Georgia and Hudson street bridges, 2,900 cubic yards. From Slip No. 1, 600 cubic yards. From Commercial slip, 6,500 cubic yards. Between Erie street bridge and Henry street, 4,000 cubic yards. At foot of Brace street, 900 cubic yards. At foot of Bird avenue, 200 cubic yards. At head of ship lock gates, 300 cubic yards. Between Erie and Evans streets bridges, 3,500 cubic yards. Between Commercial and Evans streets bridges, 2,500 cubic yards. From Ohio Basin, Wabash street side, 9,500 cubic yards.

Built 265 feet of timber docking on north side of Commercial slip, and 225 feet of guard pier on south side of said slip.

Laid concrete coping on top of berme vertical wall, between State Yard and Porter avenue bridge in Buffalo.

Rebuilt long dock between Main and Delaware streets, in Tonawanda.

Replaced 300 lineal feet of timber docking at Tonawanda dam, between Main and Delaware streets

Riprapped berme bank of canal opposite River road, in vicinity of Cherry bridge No. 184.

Inserted new snubbing posts where necessary between upper Grand Island bridge and Lock No. 72.

Repaired washout on river side of canal near Germania Park.

Removed ice jam from Tonawanda and Ellicott creeks; also from State ditch and culvert under canal leading to Niagara river.

Made general repairs to Lock No. 72 by replanking and inserting new toe posts and cross timbers.

Concrete coping was laid for 612 feet on vertical wall between Erie and Charles streets.

Concrete coping was laid on top of the vertical wall for 225 feet east of dry dock, near State street, in Buffalo, and for 300 feet in the vicinity of Porter avenue bridge.

WESTERN DIVISION.

Labor performed by the Western Division shop force was applied as follows:

Repairing and erecting derrick by adding new mast; repairing floor in blacksmith shop; repairing Section No. 9 storehouse; building foot blocks and leaders for pile driver; framing timbers for waste weir No. 6 at Fairport; removing old planking over spillway, and water wheel at Weighlock; repairing paddles in waste weir at Weighlock; making and installing new recess timbers in Weighlock; making new cap sticks, tumble gates and mitre sills for Locks Nos. 55, 56 and 58; making upper and lower gates for Lock No. 59; making balance beams for Locks Nos. 57, 58, 59 and 64; making tumble gates and platform for locks Nos. 62 and 63; making gates for Locks Nos. 64 and 72; making middle gates and upper towpath gates for Sulphur Springs Guard Lock; making 28 new paddles for Locks Nos. 57, 58, 60 and 61, and 8 paddles for Locks Nos. 64, 65 and 66; making 1 pair of gates, complete, for Lock No. 70, and 1 pair of gates and 5 extra toe posts for combined locks; making targets for Locks Nos. 62 and 66; making balance beams for general use on division; building foot bridge for Lock No. 66, and portable houses for bridge tenders at Knowlesville and Eagle Harbor. Repaired boats "Aldridge," "Kunze," and scow "Claffey."

Cleaned the outlet of Cuba reservoir and repaired apron of spillway.

EXTRAORDINARY REPAIRS.

Chap. 290, *Laws* 1908. *Chap.* 437, *Laws* 1909.

SECTION NO. 8.

General repairs made to Locks Nos. 53, 54, 55, 56, 57, 58, 59, 60 and 61, by replanking bottom, placing new joists under platforms, new balance beams, repairing piers, building new railings, new recess cap sticks and mud sills.

Excavated along east bench wall of culvert No. 12 and concreted beneath foundation.

Removed face wall of culvert No. 22 and relaid the same.

Concreted behind the wall on berme side of canal at bridge No. 32, also covering west end of bridge abutment with concrete, and pointing up the face of abutment to above high water mark to prevent water leaking through same into culvert No. 23½.

Removed bridge No. 42, which was in a very unsafe condition, and erected a new bridge in its place.

Scraped towpath where necessary throughout the section, preparatory to graveling same.

Graveled towpath as follows: For 3,000 feet between bridges Nos. 30 and 31. For 1,800 feet between bridges 31 and 31½. For 500 feet at culvert No. 21. For 300 feet between bridges 31½ and 32. For 3,600 feet between bridges 34 and 35. For 800 feet between bridge 35 and Palmyra aqueduct. For 2,300 feet between Palmyra aqueduct and bridge No. 36.

The new gravel pit east of Palmyra was stripped and timber docking in front of same was repaired.

The following specified bridges were painted: Nos. 33, 34, 35, 36, 38, 39, 40, 41, 42 and 42½.

SECTION NO. 9.

Drove 1,400 lineal feet of triple lap sheet piling along berme bank of canal west of Donnelly's bridge No. 59, in order to stop a serious leak at said culvert, and seepage through said canal bank at various points.

Drove 100 lineal feet of triple lap sheet piling at point nearly opposite Colby street, in Brighton, to prevent seepage through towpath bank from canal.

Plank sheeting was inserted for 800 lineal feet on the inner slopes of the canal banks at the high embankment east of Bushnell's Basin, in order to protect said embankments from the wash of water.

Five hundred lineal feet of plank sheeting was placed on the inner slopes of the canal banks at the high embankment in the vicinity of culvert No. 29 to protect it from the wash of water.

Excavated culvert No. 28 throughout prism of canal to foundation, and concreted sides and top of same.

Excavated old vertical wall for a distance of 600 feet, east of Lyell avenue bridge, towpath side, and rebuilt new wall.

A ditch was excavated between the Culver road and Winton road bridge to prevent damage to adjoining lands from seepage.

Scraped towpath throughout the section where necessary, preparatory to graveling.

Inserted new turbine wheels in Locks Nos. 63, 64, 65 and 66.

Painted bridges Nos. 63, 67½, 68, 69, 70, 72, 73, 74, 75, 76 and 77.

Section No. 10.

Took down and relaid 200 lineal feet of vertical wall at Hindsburg.

Riprapped banks of stream discharging at spillway in Holley.

Rebuilt 300 lineal feet of vertical towpath wall and repaired horse escape east of combined locks.

Rebuilt 80 lineal feet of timber pier on berme side of canal at southwest end of combined locks, between State race and canal.

Cleaning out and placing new planking in horse escape at bridge No. 128.

Rebuilt docking on south side of State yards and repaired wall under State buildings at Lockport.

Rebuilt berme end of culvert No. 72.

Rebuilt walls and cleaned out both ends of culvert No. 78.

Relaid towpath end wall of culvert No. 85.

Concreted sides and top of culvert No. 98.

Built houses over gates in waste weirs Nos. 15 and 16.

Repaired aprons and bulkhead at head and foot of combined locks in Lockport.

Drove 400 lineal feet of sheet piling on berme side of canal in rear of trolley substation in Albion.

Scraped towpath throughout the section where necessary, preparatory to graveling.

Graveled towpath for a distance of 7,000 feet between bridges Nos. 122 and 125.

Graveled towpath for three-quarters of a mile between bridges Nos. 138 and 139, and from Eagle Harbor to bridge No. 128.

SECTION NO. 11.

Three hundred and thirty-five feet of vertical wall which had fallen into the canal, between Rhode Island and Albany streets, in Buffalo, were rebuilt.

Sixty new snubbing posts were placed along the canal between Commercial and Mechanics streets.

Repaired scow "Tonawanda" by docking, straightening and refastening deck. New shoes and knees, recalking and painting.

Repaired scow "Buffalo" by recalking and shortening cabin so as to increase capacity.

Repaired state dredge by making new dipper arms, new spuds, anchor slides and putting floor over swinging engine.

Made new rollers for mud scow.

General repairs were made to state tug.

Reshingled roofs of the carpenter and blacksmith shops in state yard at Buffalo.

Constructed a new fence around state yard at Tonawanda.

Relaid 400 lineal feet of slope wall west of state ditch in Tonawanda.

Rebuilt 300 feet of vertical wall between Main and Seymour streets bridges in Tonawanda.

Repaired spillway in Tonawanda, by driving triple lap sheet piling and rebuilding timber work at each end.

Moved lock slip bridge at Tonawanda from abutments, excavated and took down old abutment, drove 31 piles 32 feet long and capped them with 10 by 12 inch timbers, placed concrete for new foundation and built new abutments for bridge.

Built wing wall with concrete on west side of abutment of Bouck street bridge, at Tonawanda.

Repaired timber docking on each side at foot of river lock in Tonawanda.

Painted bridges Nos. 192, 193, 194, 195, 195½, 196, 196½, 198, 200, 201, 202, 203, 204, 205, 206, 207 and 220.

SPECIAL APPROPRIATIONS.

Chap. 433. *Laws of* 1909.

Cattaraugus Indian Reservation.

Repairing Clear Creek bridge by inserting new chords, braces and posts, repairing old ones, and replanking with 3-inch Georgia pine. Building dyke across Clear creek to turn the flow of water from the south approach on east side of bridge No. 1 to its original course under the north section of said bridge and to protect new false work under the bridge. Filling in south approach to bridge to protect roadway.

Chap. 513, *Laws of* 1910.

Repairing highway bridges over 18-Mile creek in the towns of Lockport and Newfane, Niagara county.

Tonawanda State Ditch.

Removing obstructions, cleaning out, widening, deepening the State ditch in Tonawanda which passes under the canal and discharges into the Niagara river.

I am appreciative of the faithful and intelligent services rendered by the employees on this Division, and take much pleasure in acknowledging the same.

HENRY A. KUNZE,
Assistant Superintendent.

ITEMIZED REPORT *of Expenditures by Henry A. Kunze, Assistant Superintendent Public Works, for Ordinary Repairs on the Western Division, Erie Canal, during Fiscal Year Ended September 30, 1910.*

ITEMS.	Western Division office.	Western Division, Erie.	Section No. 8.	Section No. 9.	Section No. 10.	Section No. 11.	Totals.
Salary clerks, stenographer and janitress	$3,744 00						$3,744 00
Labor, special agents, foremen, etc		$27,040 60	$1,990 64	$9,587 87	$6,289 40	$11,831 61	56,740 12
Lumber		2,325 07	7,251 25	19,094 89	7,955 81	15,208 98	51,836 00
Coal		617 75	157 25	245 23	195 20	1,244 43	2,459 86
Hardware		516 43	164 04	627 66	582 06	1,267 35	3,157 54
Machinists' work and brige repairs		52 47		1,500 29	74 22	141 42	1,768 40
Stone, cement, sand, etc		2 50	87 50	1,053 60	156 40	1,349 73	2,649 73
Telephone and telegraph	521 14	202 20	77 31	26 72	202 08	147 61	1,177 06
Gas and electric light and power	18 60	321 64		75 12	194 09	281 00	890 45
Office furniture, stationery, postage, etc	298 40	28 75		12 30			339 45
Rent and use of boats, tools, etc		130 65	670 00		410 80	370 00	1,581 45
Freight, cartage and towing		573 66	46 30	26 80	94 15	225 85	966 76
Ship chandlery, boat supplies and repairs		1,554 24	110 65	114 34	412 15	1,169 33	3,360 71
Expense, traveling, livery, etc		1,390 81	550 45	820 84	846 65	131 75	3,740 50
Castings, machinery and supplies for locks and bridges		647 86	222 07	486 02	2,153 28	68 78	3,578 01
Diving, rubber goods, etc		216 26		113 32	46 00	844 55	1,220 13
Paints and oils		303 33	271 49	372 81	264 14	257 29	1,469 06
Equipment, machinery, etc		5,186 88	299 40	253 32	214 10	259 22	6,212 92
Miscellaneous			448 76	98 38	5 60	38 04	590 78
Totals	$4,582 14	$41,111 10	$12,347 11	$34,509 51	$20,096 13	$34,836 94	$147,482 93

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section* 8 *of the Erie canal, under the charge of R. A. Vanderboget, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

	Total expenditures.
Locks	$817 12
Lock-tending (exclusive of oil)	14,700 15
Waste-weirs	66 00
Road bridges (wood)	2,047 56
State scows	90 00
Store-houses	55 00
Cleaning out bottom of canal during spring repairs	1,522 52
Slope wall	1,190 94
Docking	1,047 50
Repairs of breaches	58 92
Watching canal	1,956 81
Miscellaneous expenditures	252 13
Other work of consequence which does not come under any of the above heads, viz:	
Piling lumber	219 78
Setting snubbing posts	212 30
Cleaning out state ditches	248 51
Building fences	375 29
Mowing weeds	1,182 87
Disbursing clerk	637 50
Publishing and filing abstracts	42 28
Total	$26,823 18

REPAIRS AND IMPROVEMENTS.

Locks.

The old plank was taken off the bottom of Locks Nos. 55, 58, 60 and 61, and the old cement taken out from between timbers, new concrete put in its place, and new mud sills put in and the bottoms replanked.

Put in one new mitre sill in Lock No. 58 and one in Lock No. 60.

One balance beam was put on Lock No. 53, three on Lock No. 54, two on Lock No. 55, one on Lock No. 56, three on Lock No. 57, one on Lock No. 58, two on Lock No. 59, and one on Lock No. 60.

One pair lock gates was put on lower end and one pair on upper end of Lock No. 59.

During spring repairs locks were overhauled, new paddles put in where needed, and minor repairs made to all locks on Section.

Bridges.

Bridge No. 42 has been replaced with a new structure.

Bridges Nos. 3, 4, 18, 20, 25, 31½, 32 and 40 have received new joists and new floors.

All bridges on the Section have had part new joists and new plank inserted, new sidewalks and railings have been built where necessary.

Docking.

Docking to the amount of 4,000 lineal feet has been put in at different points along the section.

Waste-Weirs.

Waste-weirs Nos. 1, 2 and 3 were rebuilt and masonry pointed.

Towpath.

The towpath has been scraped and graded the entire length of the section, and has been kept in good condition by the State boat crews.

Slopewalls.

Slopewalls have been repaired over entire section.

Cutting Weeds.

Weeds and brush have been cut on embankments over the section.

Ditching.

A considerable amount of ditching has been done along the section where necessary.

Prism of Canal.

During spring cleaning, bars were removed from various places along the section, and prism put in good shape.

Water.

The required depth of water has been maintained during the season.

R. A. VANDERBOGET,
Superintendent.

Annual Report, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section* 9 *of the Erie canal, under the charge of Jacob Allmeroth, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks pointing with cement mortar	5	$1,020 41
Locks repairs	5	173 14
Lock-tending (exclusive of oil)	5	8,256 09
Bridges lift-tending	14	4,686 28
Bridges road (iron)	36	....
Bridges road (wood)	8	....
Bridges tow-path (iron)	3	....
Bridges foot (iron)	2	....
Bridges new barge canal	8	1,473 62
Aqueduct painting	1	120 75
Waste-weirs new bulkheads	7	372 38
Stop gates	3	491 70
Culverts	39	97 31
Weigh-lock	1	....
State scows	2	....
Small boats	2	....
Lock-houses	5	....
Watch-houses moving from locks to stop gates	5	161 45
Sorting, measuring and piling lumber	....	230 90
Removing material	....	155 65
Raising and repairing tow-path and berme bank	....	462 97
Cleaning out bottom of canal during spring repairs	....	838 26
Slope and vertical walls repairs	....	1,643 69
Mowing weeds	....	1,171 50
Repairs to breaches	....	292 93
Setting snubbing posts	....	239 13
Removing sunken boats	....	222 20
Ditching on three mile level	....	103 07
Cleaning state yard	....	109 10
Setting guard rails	....	89 61
Burying dead horses	....	17 03
Watching canal	....	3,421 19
Patrolman patroling canal	....	1,232 46
Disbursing clerk	....	637 50
Publishing and filing abstracts	....	55 27
Total	....	$27,775 59

REPAIRS AND IMPROVEMENTS.

Locks 62, 64, 66.

Lock 62. Removed tumble gate and platform and replaced the same new.

Lock 64. Removed lower gates of long lock and replaced the same new; removed toe post in lower lock and replaced the same new; rebuilt lower cribbing.

Lock 66. Removed four decayed balance beams and replaced the same new.

Waste-Weirs.

Waste-weir No. 6. A new bulkhead has been built at this waste-weir.

Stop-Gates.

Cartersville. The old bulkhead removed and replaced by a new bulkhead; the old lock-house from Lock 63 moved to this stop-gate.

Bushnell's Basin. The old bulkhead removed and replaced by a new bulkhead; the old lock-house from Lock 64 moved to this stop-gate.

Adams Basin. The old lock-house from Lock 66 moved to this stop-gate.

Slope and Vertical Walls.

All fallen vertical walls have been relaid, and about one mile of slope wall was relaid under spring repairs.

Towpath.

The towpath has been graded the entire section.

Snubbing Posts.

Over one hundred snubbing posts have been set in concrete with a cement plate and painted white.

Weeds and Brush.

Weeds and brush has been cut on entire section.

Aqueduct at Rochester.

This aqueduct has been entirely stripped of old lumber, and replaced with a new coping, new rail, and newly planked and painted.

Guard Rails.

Guard rails have been set at all dead end streets in the city of Rochester to prevent accidents.

Water and Navigation.

Water has been kept to target throughout the season.

Navigation. No delays have occurred during the past season.

All bridges on section have been kept in good repair, rejoist and planked where needed.

RECOMMEND IMPROVEMENTS TO BE MADE THIS WINTER.

Locks 62, 63, 64, 65, 66.

Lock 62. New bottom in long lock; new head pier; lower cribbing rebuilt.

Lock 63. During the past season a serious leak occurred at this lock; temporary repairs were made by building a concrete wall inside of long lock from jog 26 feet east, and a temporary concrete bottom with the assistance of a diver; new bottom in long lock and walls repaired; new platform under tumble gate; new head pier; lower cribbing rebuilt.

Lock 64. New platform under tumble gate; new head pier; new bottom in long lock and walls repaired.

Lock 65. New head pier; long pier repaired; lower cribbing rebuilt; new bottom in long lock and walls repaired.

Lock 66. New lower gates in short and long locks; new head pier; lower cribbing rebuilt.

Donnelly's Culvert.

Culvert 36. A serious leak occurred at this culvert; temporary repairs were made by blanketing the same; three boat loads of clay were used to weight blanket. This culvert should be stripped and covered with a concrete jacket, and a cut-off wall built across culvert in berme bank.

Vertical Walls.

Vertical wall from cross-over bridge at Weighlock to a distance of 600 feet east, veneered with concrete.

Sunken Hulls.

Removal of ten sunken hulls at Culver road bridge.

JACOB ALLMEROTH,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section* 10 *of the Erie canal, under the charge of Charles L. Papworth, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	6	$2,389 70
Lock-tending (exclusive of oil)	....	7,490 08
Lock-gates	24	....
Aqueducts	1	17 68
Waste-weirs	10	105 50
Culverts	66	116 62
Road bridges (wood)	5	2,671 75
Road bridges (iron)	50	....
State scows 3, pump boat 1	4	194 60
Small boats	2	....
Lock-houses	1	....
Work-shops	2	....
Watch-houses	6	....
Store-houses	1	....
Timber-sheds	2	....
Piling machines	....	223 52
Raising and repairing tow-path and berme bank not including repairs to slope walls.	....	1,503 43
Cleaning out bottom of canal during spring repairs	....	623 87
Docking	....	1,718 73
Watching canal	....	5,056 77
Other work of consequence which does not come under any of the above heads, viz:		
Sorting and piling lumber	....	456 16
Cutting weeds and brush	....	1,489 67

ANNUAL REPORT *Showing the name and number of structures or works, on section* 10 — (Continued).

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Patrolmen	....	$1,241 94
Disbursing clerk	....	600 00
Regulating water at Lockport	....	931 45
Watching state property	....	978 39
Watching O. O. creek feeder and S. S. guard lock	....	130 00
Watching stop-gates	....	2,177 42
Repairing stop-gates	....	244 34
Tending bridges	....	2,885 68
Publishing and filing	....	96 27
Inspecting section 10	....	37 70
Teaming cinders to State yard	....	16 80
Removing flood wood	....	245 20
Boating lumber for repairs	....	78 16
Rebuilding old canal fence at Holley	....	117 23
Building wall at Albion dry docks	....	274 50
Assisting sunken boats	....	21 75
Total	....	$34,134 91

REPAIRS AND IMPROVEMENTS.

Navigation was delayed from August 1st to August 3d, caused by the United Engineering Co.'s cantilever falling into the canal at a point east of bridge No. 166, where it was being used for barge canal purposes.

Old gates were removed from east end of Lock No. 71, north tier, and new ones placed therein.

General repairs have been made to combined locks and Sulphur Spring Guard Lock.

All bridges have been inspected and repaired where needed.

Necessary repairs have been made to canal banks, waste-weirs, stop-gates and structures.

State boats were repaired and painted.

Weeds and brush have been cut the entire length of section.

CHARLES L. PAPWORTH,
Superintendent.

ANNUAL REPORT, *showing the name and number of structures or works, the different heads of expenditures, and the cost of each, on section* 11 *of the Erie canal, under the charge of W. J. Hingston, superintendent of repairs, during the* 365 *days ended September* 30, 1910.

STRUCTURES OR WORKS, ETC.	Whole number on section.	Total expenditures.
Locks	3	....
Lock-tending (exclusive of oil)	....	$5,508 75
Watching guard lock No. 72	....	50 00
Change bridges (iron)	3	....
Farm bridges (wood)	35	....
Farm bridges (iron)	3	....
Road bridges (wood)	4	....
Road bridges (iron)	24	....
Tow-path bridges (wood)	4	....
Tow-path bridges (iron)	6	....
State scows	3	....
Small boats	3	....
Bridge tending	....	2,925 00
General repairs	....	5,155 68
Tending flood gates, cleaning snow and ice from bridges at Tonawanda	....	227 50
Cleaning snow and ice from bridges and piling lumber in State yard at Buffalo	....	533 00
Raising and repairing tow-path and berme bank not including repairs to slope walls.	....	6,193 25
Bank watch	....	1,241 95
Disbursing clerk	....	900 00
Publishing abstract of expenditures	....	52 50
Watching State yard	....	960 00
Total	....	$23,747 63

REPAIRS AND IMPROVEMENTS.

Nothing occurred to delay navigation on this section during the past year.

The towpath was kept in excellent repair; about 800 feet of the towpath, between Martinsville and Bushes Bridge settled considerably and was repaired with clay, stone and brick and surfaced with cinders, all of which was boated from Buffalo.

Snubbing posts were placed along the towpath where necessary.

About 3,400 lineal feet of docking timber was laid between Lock No. 72 and the Commercial slip.

All bridges in this section were replanked and otherwise repaired when necessary, including the iron railings in Hudson, Genesee, Lloyd, Lake and Amherst street bridges.

New iron fenders were placed in the abutments of Nos. 1 and 2 slip bridges, and rub irons in Nos. 1, 2 and 3 slip bridges; also on new farm bridge which was built to replace the old bridge over the State ditch, between Delaware street and the brick yard at Tonawanda.

The following repairs were made to the locks in this section: Repairs to Sloop lock; two new balance beams.

Four new runboards; replaced four lock-gates; new iron railing, levers and straps.

Repairs to Lock No. 72. Four balance beams; replanked five lock-gates and repaired rods, paddles and line carriers.

Repairs to river lock at Tonawanda. Two balance beams, new runboards and replanked four lock gates.

All State boats on this section were kept in good repair.

The State shops were reshingled and repainted, and the office repainted.

All weeds and grass were cut from towpath and slope wall, between Pendleton and Buffalo.

W. J. HINGSTON,
Superintendent.

TABLES

ACCOMPANYING THE

Annual Report of the Superintendent of Public Works.

TABLE

Exhibiting the date of the opening and closing of the Hudson river, and the number of days open; also, the time of commencement and close of each navigable season of canals, and the number of days of navigation since 1824; also the date of the opening of Lake Erie since 1827.

OPENING AND CLOSING OF THE HUDSON RIVER.			COMMENCEMENT AND CLOSE OF NAVIGATION.			Opening of the lake.
River open.	River closed.	Days open.	Canal open.	Canal closed.	Navigable days.	
March 3, 1824	January 5, 1824	309	April 30, 1824	December 4, 1824	219	....
March 6, 1825	December 13, 1825	283	April 12, 1825	December 5, 1825	238	....
February 25, 1826	December 13, 1826	302	April 25, 1826	December 18, 1826	243	....
March 20, 1827	November 25, 1827	251	April 22, 1827	December 18, 1827	241	April 21, 1827
February 8, 1828	December 23, 1828	220	March 27 1828	December 20, 1828	269	April 1, 1828
April 1, 1829	January 14, 1829	286	May 2, 1829	December 17, 1829	230	May 10, 1829
March 15, 1830	December 25, 1830	283	April 30, 1830	December 17, 1830	242	May 5, 1830
March 15, 1831	December 6, 1831	262	April 16, 1831	December 1, 1831	230	May 8, 1831
March 25, 1832	December 31, 1832	289	April 25, 1832	December 21, 1832	241	April 27, 1832
March 21, 1833	December 13, 1833	277	April 9, 1833	December 12, 1833	238	April 23, 1833
February 29, 1834	December 15, 1834	291	April 17, 1834	December 12, 1834	240	April 6, 1834
March 25, 1835	November 30, 1835	268	April 15, 1835	November 30, 1835	230	May 8, 1835
April 4, 1836	December 7, 1836	244	April 25, 1836	November 26, 1836	216	Apri 27, 1836
March 27, 1837	December 14, 1837	261	April 20, 1837	December 9, 1837	234	May 16, 1837
March 19, 1838	November 25, 1838	257	April 11, 1838	December 25, 1838	228	March 31, 1838
March 25, 1839	November 18, 1839	286	April 20, 1839	December 16, 1839	241	April 11, 1839
February 25, 1840	November 8, 1840	285	April 20, 1840	December 9, 1840	228	April 27, 1840
March 24, 1841	November 19, 1841	286	April 24, 1841	November 30, 1841	221	April 14, 1841
February 4, 1842	November 28, 1842	308	April 20, 1842	November 28, 1842	222	March 7, 1842
April 13, 1843	December 10, 1843	242	May 1, 1843	November 30, 1843	214	May 6, 1843
March 18, 1844	December 17, 1844	278	April 18, 1844	November 26, 1844	222	March 14, 1844
February 24, 1845	December 3, 1845	283	April 15, 1845	November 29, 1845	228	April 3, 1845
March 18, 1846	December 14, 1846	275	April 16, 1846	November 25, 1846	234	April 11, 1846
April 7, 1847	December 25, 1847	263	May 1, 1847	November 30, 1847	214	April 23, 1847
March 22, 1848	December 27, 1848	292	May 1, 1848	December 9, 1848	223	April 9, 1848
March 19, 1849	December 26, 1849	286	May 1, 1849	December 5, 1849	219	March 25, 1849
March 10, 1850	December 17, 1850	282	April 22, 1850	December 11, 1850	234	March 25, 1850
February 25, 1851	December 14, 1851	293	April 15, 1851	December 5, 1851	235	April 2, 1851

Table exhibiting the date of the opening and closing of the Hudson river, etc.— (Continued).

OPENING AND CLOSING OF THE HUDSON RIVER.		COMMENCEMENT AND CLOSE OF NAVIGATION.				Opening of the lake.
River open.	River closed.	Days open.	Canal open.	Canal closed.	Navigable days.	
March 28, 1852	December 23, 1852	270	April 20, 1852	December 15, 1852	239	April 20, 1852
March 23, 1853	December 21, 1853	274	April 20, 1853	December 20, 1853	245	April 14, 1853
March 17, 1854	December 8, 1854	266	May 1, 1854	December 3, 1854	217	April 28, 1854
March 27, 1855	December 20, 1855	268	May 1, 1855	December 10, 1855	224	April 21, 1855
April 11, 1856	December 14, 1856	248	May 5, 1856	December 4, 1856	214	April 2, 1856
February 27, 1857	December 27, 1857	302	May 6, 1857	December 15, 1857	223	April 27, 1857
March 20, 1858	December 17, 1858	273	April 28, 1858	December 8, 1858	225	April 15, 1858
March 13, 1859	December 10, 1859	273	April 15, 1859	December 12, 1859	242	April 7, 1859
March 6, 1860	December 14, 1860	283	April 25, 1860	December 12, 1860	232	April 17, 1860
March 5, 1861	December 13, 1861	294	May 1, 1861	December 10, 1861	224	April 13, 1861
April 4, 1862	December 19, 1862	259	May 1, 1862	December 10, 1862	224	April 15, 1862
April 3, 1863	December 1, 1863	252	May 1, 1863	December 9, 1863	223	April 3, 1863
March 11, 1864	December 12, 1864	277	April 30, 1864	December 8, 1864	223	April 13, 1864
March 22, 1865	December 16, 1865	270	May 1, 1865	December 12, 1865	226	April 26, 1865
March 20, 1866	December 15, 1866	270	May 1, 1866	December 12, 1866	226	April 28, 1866
March 26, 1867	December 8, 1867	257	May 6, 1867	December 20, 1867	229	April 21, 1867
March 24, 1868	December 5, 1868	252	May 4, 1868	December 7, 1868	217	April 19, 1868
April 5, 1869	December 9, 1869	248	May 6, 1869	December 10, 1869	218	May 1, 1869
March 31, 1870	December 17, 1870	261	May 10, 1870	December 8, 1870	213	April 16, 1870
March 12, 1871	November 29, 1871	263	April 24, 1871	December 1, 1871	220	April 1, 1871
April 7, 1872	December 9, 1872	247	May 13, 1872	December 1, 1872	202	May 6, 1872
April 16, 1873	November 22, 1873	221	May 15, 1873	December 5, 1873	205	April 29, 1873
March 19, 1874	December 12, 1874	269	May 5, 1874	December 5, 1874	215	April 18, 1874
April 13, 1875	November 29, 1875	229	May 18, 1875	Nov. 30, 1875 (by ice)	297	May 12, 1875
April 1, 1876	December 2, 1876	245	May 4, 1876	December 1, 1876	211	May 4, 1876
March 30, 1877	December 31, 1877	277	May 8, 1877	December 7, 1877	214	April 17, 1877
March 14, 1878	December 30, 1878	282	April 15, 1878	December 7, 1878	237	March 24, 1878
April 4, 1879	December 20, 1879	261	May 8, 1879	December 6, 1879	212	April 24, 1879
March 5, 1880	November 25, 1880	266	April 20, 1880	Nov. 21, 1880 (by ice)	216	March 19, 1880
March 21, 1881	January 2, 1881	288	May 17, 1881	December 8, 1881	206	May 1, 1881
March 8, 1882	December 5, 1882	273	April 11, 1882	December 7, 1882	241	March 26, 1882
March 29, 1883	December 15, 1883	261	May 7, 1883	December 1, 1883	208	May 4, 1883
March 25, 1884	December 19, 1884	269	May 6, 1884	December 1, 1884	209	April 25, 1884
April 7, 1885	December 7, 1885	247	May 11, 1885	December 1, 1885	205	May 2, 1885

March 30, 1886	December 3, 1886	248	May 1, 1886	December 1, 1886	214	April 25, 1886
April 6, 1887	December 28, 1887	258	May 7, 1887	December 1, 1887	209	April 17, 1887
April 7, 1888	December 14, 1888	252	May 10, 1888	December 3, 1888	208	April 14, 1888
March 10, 1889	Open all winter	286	May 1, 1889	November 30, 1889	214	April 10, 1889
Open entire year	December 2, 1890	337	April 28, 1890	November 30, 1890	217	March 31, 1890
March 24, 1891	December 24, 1891	277	May 5, 1891	December 5, 1891	215	April 13, 1891
April 1, 1892	December 22, 1892	266	May 1, 1892	December 5, 1892	219	April 10, 1892
April 1, 1893	December 6, 1893	250	May 3, 1893	November 30, 1893	212	April 15, 1893
March 18, 1894	December 24, 1894	281	May 1, 1894	November 30, 1894	214	April 28, 1894
April 2, 1895	December 9, 1895	252	May 3, 1895	December 5, 1895	216	April 4, 1895
April 7, 1896	December 19, 1896	256	May 1, 1896	December 1, 1896	215	April 19, 1896
April 29, 1897	December 7, 1897	223	May 8, 1897	December 1, 1897	208	April 6, 1897
April 13, 1898	December 13, 1898	244	May 7, 1898	December 10, 1898	217	March 25, 1898
April 17, 1899	December 15, 1899	242	April 25, 1899	December 1, 1899	220	April 28, 1899
April 9, 1900	December 11, 1900	246	April 25, 1900	December 1, 1900	220	April 22, 1900
March 28, 1901	December 1, 1901	248	May 7, 1901	November 30, 1901	207	April 20, 1901
March 17, 1902	December 8, 1902	266	April 24, 1902	December 4, 1902	224	April 9, 1902
March 14, 1903	December 2, 1903	263	May 2, 1903	November 28, 1903	210	April 6, 1903
April 4, 1904	December 4, 1904	244	May 5, 1904	November 26, 1904	205	May 10, 1904
April 3, 1905	December 15, 1905	257	May 4, 1905	November 28, 1905	209	April 22, 1905
March 22, 1906	December 5, 1906	260	May 2, 1906	November 28, 1906	211	April 15, 1906
March 29, 1907	December 6, 1907	253	May 1, 1907	December 10, 1907	224	April 6, 1907
March 23, 1908	December 18, 1908	271	May 5, 1908	November 30, 1908	210	April 25, 1908
March 15, 1909	December 22, 1909	283	May 15, 1909	November 15, 1909	185	April 22, 1909
March 17, 1910	December 19, 1910	268	May 15, 1910	November 15, 1910	185	April 15, 1910

STATEMENT *of the number of locks, their lift in feet, total lockage of each canal, etc., of all the canals in the State of New York.*

NAME OF CANAL.	Length in miles.	Lockage in feet.
Erie canal	351.78	655.80
Navigable feeders of same	3.35	....
Champlain canal	66.00	179.50
Pond above Troy dam	3.00	....
Glens Falls feeder and pond	12.00	132.00
Black River canal	35.33	1,082.25
Black River feeder	13.47	....
Black River improvement	42.50	....
Oneida Lake canal	....	62.00
Oswego canal	38.00	154.85
Oneida river improvement	20.00	7.85
Seneca river towing-path	5.00	....
Baldwinsville canal	1.00	8.00
Cayuga and Seneca canal	22.77	76.61
Cayuga inlet	2.00	....
Total	622.20	2,357.86

NAME OF CANAL.	SITE OF CANAL.				NUMBER AND SIZE OF LOCKS.			Average burden of boats.	Maximum burden of boats.
	Length in miles.	Width on surface.	Width on bottom.	Depth of water.	Number of locks.	Length between quoins.	Width in clear.		
Erie canal	363	40	28	4	83	90	15	70	76
Enlargement of same	351¾	70	56	7	72	110	18	210	240
Oswego canal	38	40	24	4	18	90	15	70	76
Enlargement of same	38	70	56	7	18	110	18	210	240
Cayuga and Seneca canal	21	40	24	4	10	90	16	70	76
Enlargement of same	23	70	56	7	11	110	18	210	240
Champlain canal	66	50	35	5	20	110	18	85	120
Glens Falls feeder	12	50	35	5	12	100	18	80	85
Pond above Troy dam	3	.....	.....	.....	1	.....	.....	.....	.....
Black River canal and feeder	50	42	26	4	100	90	15	70	76
Black River improvement	42	.....	.....	.....	1	110	18	70	76
Oneida River improvement	20	80	60	4½	2	120	30	70	76
Oneida Lake canal	70	70	56	7	7	110	18	220	220
Baldwinsville and Seneca tow-path	5¾	40	24	4	1	90	15	70	76

ERIE CANAL.

REMARKS.	Old canal (not now in existence).	Enlargement.
Construction authorized	April 15, 1817	May 11, 1835.
Construction commenced	July 4, 1817	August, 1836.
Construction completed	October 26, 1825	September, 1862.
Estimated cost at engineer's prices	$4,926,738	$23,402,803.
Actual cost of construction	$7,143,789	$44,465,414.
Total feet of lockage	675½	655 80–100 feet.
Length from Albany to Buffalo	363 miles	351¾ miles.
Number of locks and size of chambers	83 locks, 90x115	72 locks, 110x18.
Size of prism	40 and 28x4	70 and 56x7.
Maximum dimension of boats	78 62–100x14 46–100x3½, draft	98x17.5–12x6 feet draft.
Burden of boats	75 tons	240 tons.

Counties through which the Erie canal runs — Albany, Cayuga, Erie, Herkimer, Madison, Monroe, Montgomery, Niagara, Onondaga, Oneida, Orleans, Saratoga, Schenectady, and Wayne.

LOCKS.

No. of lock.	Double or single.	Lift.	No. of lock.	Double or single.	Lift.	No. of lock.	Double or single.	Lift.
1	Double	15½	25	Double	8	49	Double	6
2	Double	9½	26	Double	8	50	Double	6 11–12
3	Double	11¼	27	Double	8	51	Double	5½
4	Double	11¼	28	Double	8	52	Double	11
5	Double	10	29	Double	7	53	Double	6
6	Double	10	30	Double	10½	54	Double	7½
7	Double	10	31	Double	6	55	Double	6
8	Double	10	32	Double	8	56	Double	10
9	Double	10	33	Double	6	57	Double	8
10	Double	10	34	Double	8	58	Double	8
11	Double	10	35	Double	8	59	Double	8
12	Double	10	36	Double	10	60	Double	10
13	Double	10	37	Double	10	61	Double	9
14	Double	10	38	Double	9½	62	Double	9
15	Double	10	39	Double	10½	63	Double	9
16	Double	10	40	Double	8	64	Double	10
17	Double	10	41	Double	8	65	Double	10
18	Double	10½	42	Double	8	66	Double	9
19	Double	8½	43	Double	8	67 68 69 70 71	Double	55 10–12
20	Double	10	44	Double	10½			
21	Double	11½	45	Double	10½			
22	Double	11½	46	Double	3			
23	Double	8	47	Double	10½			
24	Double	8	48	Double	10½	72 gd. Blk. Rk. & Buf.	Double	2

LOCATION OF LOCKS.

COUNTIES.	Number of locks.	COUNTIES.	Number of locks.
Albany	1 to 18, inclusive	Onondaga	47 to 51, inclusive.
Saratoga	19 and 20	Cayuga	52.
Schenectady	21 to 25, inclusive	Wayne	53 to 60, inclusive.
Montgomery	26 to 34, inclusive	Ontario	....
Herkimer	35 to 45, inclusive	Monroe	61 to 66, inclusive.
Oneida	46	Orleans	....
Madison	....	Niagara	67 to 71, inclusive.

CHAMPLAIN CANAL AND GLENS FALLS FEEDER.

Construction authorized	April 15, 1817.
Glens Falls feeder authorized	April, 1822.
Estimated cost of canal at engineer's prices	$871,000.
Navigation opened from Fort Edward to Lake Champlain	November 24, 1819.
Canal completed from Waterford to Lake Champlain	1822.
Canal, cost of construction up to 1827	$921,011.
Feeder, cost of construction up to 1837	$91,944.
Total cost of both included improvements, exclusive of ordinary repairs, June, 1868	$2,378,910.
Number of locks on canal, 20; feeder 13	Size, 110x18 and 100x15.
Length of canal, 66 miles; feeder, 7 miles; pond, 5 miles	78 miles.
Size of prism, canal and feeder	40.26x4.
Size authorized, chapter 213, Laws of 1860	50.35x5.
Total cost, including improvements and enlargements, up to 1875	$4,044,000.

Counties through which the Champlain canal runs — Rensselaer, Saratoga, Warren and Washington.

The Glens Falls feeder is located in the counties of Warren and Washington.

LOCKS.

CHAMPLAIN CANAL.						GLENS FALLS FEEDER.			
No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1	10¾	8	8¾	15	8	1	10	8	10
2	10¾	9	10	16	7	2	10	9	10
3	8½	10	9¾	17	2¼	3	10	10	10
4	9	11	11¼	18	9	4	10	11	11
5	9	12	9	19	9	5	10	12	12
6	9	13	10¼	20	10	6	10	13	10
7	9¼	14	8	....	....	7	10	....	.....

Black River Canal Feeder and Black River Improvement.

Construction authorized	April 19, 1836.
Construction commenced	January, 1838.
Estimated cost at engineers' prices	$1,068,437.
Estimated cost at contract prices	$2,431,069.
Canal completed	1849.
Cost of construction	$3,581,954.
Number and size of locks	109 locks; 90x15.
Length of canal to Lyons Falls	35 miles.
Length of river to Carthage, and fall	42 miles; 9¼ feet.
Size of prism of canal and feeder	42 and 28x4.
Length of navigable feeder, and fall	10⅓ miles; 6 10–100 feet.
Burden of boats	45 to 50 tons.
Lockage of canal	1,082¼ feet.

Locks.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1	10	23	10	45	10	67	10	89	10
2	10	24	10	46	10	68	9	90	10
3	10	25	10	47	10	69	9	91	12
4	10	26	10	48	10	70	9	92	10
5	10	27	10	49	10	71	10	93	10
6	10	28	10	50	10	72	10	94	10
7	10	29	10	51	10	73	10	95	10
8	11	30	10	52	10	74	10	96	10
9	12	31	10	53	10	75	10	97	10
10	11	32	10	54	10	76	10	98	10
11	11	33	10	55	10	77	10	99	10
12	11	34	10	56	10	78	10	100	10
13	8	35	10	57	10	79	10	101	10½
14	8	36	10	58	10	80	9	102	10¼
15	8	37	10	59	10	81	9	103	4
16	10	38	10	60	10	82	9	104	10
17	8	39	10	61	10	83	9	105	10
18	10	40	10	62	10	84	9	106	11
19	8	41	10	63	10	85	10	107	11
20	10	42	10	64	10	86	11½	108	12
21	10	43	10	65	10	87	10	109	12
22	10	44	10	66	10	88	10		

Counties through which the Black River canal runs — Oneida and Lewis.

Oneida Lake Canal and Oneida River Improvement.

REMARKS.	Oneida Lake canal.	Oneida river improvement.
Construction authorized	March 22, 1832	April 29, 1839.
Estimated cost at engineers' prices	$40,000	$100,049.
Construction completed	1836	1850
Cost of construction	$450,678	$368,164.
Purchased of company by State	May 11, 1840	For $50,000.
Enlargement of locks authorized	Chapter 46, Laws of 1860	
Number and size of new locks	7, 110x18	2, 120x30½.
Size of prism	40x20x4	80x60x4½.
Length	7 miles	20 miles.
Feet of lockage	60¼ feet	No. 1, 3 ft.; No. 2, 3¼ ft.

LOCKS.

PRESENT OLD LOCKS.						ENLARGED LOCKS AUTHORIZED.					
No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift
1	7½	4	10	6	7½	1	8½	4	10½	6	8
2	8½	5	9¼	7	6 1/12	2	8¼	5	9½	7	7½
3	9	......	......	......	......	3	8	......	......	......	......

OSWEGO CANAL.

REMARKS.	Oswego canal.	Enlarged Oswego canal.
Construction authorized	April 20, 1825	April 15, 1854.
Enlargement of locks	....	Chapter 262, Laws of 1847.
Estimated cost at engineers' prices	$277,000	$1,926,336.
Estimated cost at contract prices	$437,000	$2,051,190.
Construction completed	December 10, 1828	September, 1862.
Cost of construction	$565,473	$4,427,589.
Number of locks and size	18, 90 x 15	17, 110 x 18.
Feet of lockage	154, 85 feet	154, 85 feet.
Average cost of one lock	$10,000	$31,000.
Size of prism of canal	40 and 26 x 4	70 and 56 x 7 feet.
Guard locks	Six	Five.
Burden of boats	50 to 75 tons	230 tons.
Length of canal	38 miles	38 miles.

LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1	11	4	9.6	8	11¼	12	11¼	16	8⅔
2	11	5		9	7¼	13	5.65	17	10½
3	10½	6	7	10	9	14	9½	18	9¼
		7	5.866	11	11⅔	15	5¾		

Counties through which the Oswego canal runs — Onondaga and Oswego.

CAYUGA AND SENECA CANAL — CAYUGA INLET.

REMARKS.	Cayuga and Seneca canal.	Cayuga inlet.
Construction authorized, enlargement of locks	April 20, 1825	May 25, 1836.
Enlargement of prism		April 15, 1854.
Estimated cost at engineers' prices	$811,188	$150,000.
Estimated cost at contract prices	$795,272	$160,396.
Canal completed	November 15, 1828	September, 1862.
Cost of construction	$2,010,320	$214,000.
Number of locks and size	11, 110 x 18	1, 110 x 18.
Feet of lockage	83½	
Length and size of prism		24⅜ miles, 70 and 56 x 7.

LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1	7.28	4	9	6	9.60	8	5.70	10	10
2	7	5	9	7	6	9	10	11	3
3	10								

Counties through which the Cayuga and Seneca canal runs — Cayuga, Seneca and Ontario.

ERIE CANAL.

A List of the principal places on the canals, and their distance from each other, as adopted by the Canal Board.

NAMES OF PLACES.	Albany.	West Troy.	Schenectady.	Fultonville.	Little Falls.	Utica.	Rome.	Syracuse.	Jordan.	Montezuma.	Lyons.	Palmyra.	Rochester.	Brockport.	Albion.	Medina.	Lockport.	Tonawanda.	Lower Black Rock.	Buffalo.
Adam's Basin	274	267	244	218	187	164	149	108	89	175	57	42	15	5	19	29	47	66	74	83
Albany	.....	7	30	56	87	110	125	166	105	199	217	232	259	279	293	303	321	340	348	380
Albion	293	286	263	237	206	183	168	127	108	94	76	61	34	14	.....	10	28	47	55	996
Auriesville	53	46	26	3	34	57	72	113	132	146	164	179	206	226	240	250	268	287	295	565
Belle Isle	172	165	142	116	85	62	47	6	13	27	45	60	87	107	121	131	149	168	176	712
Black Rock	349	342	319	93	262	239	224	183	164	150	132	117	90	70	56	46	28	9	1	.....
Bolivar	152	145	122	96	65	42	27	14	33	47	65	80	107	127	141	151	169	188	196	200
Brighton	256	249	226	200	169	146	131	90	71	57	39	24	3	23	37	47	65	84	92	92
Brockport	279	272	249	223	192	169	154	113	94	80	62	47	20	.....	14	24	42	61	69	73
Brockville	288	281	258	232	201	178	163	122	103	89	71	56	29	9	5	15	33	52	60	64
Brockways	269	262	239	213	182	159	144	103	84	70	52	37	10	10	24	34	52	71	79	83
Buffalo	352	345	322	296	265	242	227	186	167	153	135	120	93	73	59	49	31	12	4	.....
Bushnell's Basin	248	241	218	192	161	138	123	82	63	49	31	16	11	31	45	55	73	92	100	104
Camillus	175	168	145	119	88	65	50	9	10	24	42	57	84	104	118	128	146	165	173	177
Canajoharie	68	61	38	12	19	42	57	98	117	131	149	164	191	211	225	235	253	272	280	284
Canastota	145	138	115	89	58	35	20	21	40	54	72	87	114	134	148	158	176	195	203	207
Canaseraga Landing	150	143	120	94	63	40	25	16	35	49	67	82	109	129	143	153	171	190	198	202
Canton	180	173	150	124	93	70	55	14	5	19	37	52	79	99	113	123	141	160	168	172
Cartersville	250	243	220	194	163	140	125	84	65	51	33	18	9	29	43	53	71	90	98	102
Centreport	192	185	162	130	105	82	67	26	7	7	25	40	67	87	101	111	129	148	156	160
Chittenango	151	144	121	95	64	41	27	15	34	48	66	81	108	128	142	152	170	189	197	201
Clyde	210	203	180	154	123	100	85	44	25	11	7	22	49	69	83	93	111	133	138	142
Cohoes	11	4	19	45	76	99	114	155	174	188	206	221	248	268	282	292	310	329	337	341
Cold Spring	186	179	156	130	99	76	61	20	1	13	31	46	73	93	107	117	135	154	162	166
Cooley's Basin	277	270	247	221	190	67	152	111	92	78	60	45	18	2	16	26	44	63	71	75
Crescent	14	7	16	42	73	96	141	152	171	185	203	218	245	265	279	289	307	326	334	338
Dunbarton	136	129	106	80	49	26	11	30	49	63	81	96	123	143	157	167	185	204	212	216
Durhamville	140	133	110	84	53	30	15	26	45	59	77	92	119	139	153	163	181	200	208	212
Eagle Harbor	296	289	266	240	209	186	171	130	111	97	79	64	37	17	3	7	25	44	52	66
East Arcadia	220	213	190	164	133	110	95	54	35	21	3	12	39	59	73	83	101	120	128	132

East Canada Creek	82	75	52	26	5	28	43	84	103	117	135	150	177	197	211	221	239	258	266	270
Fairport	244	237	214	188	157	134	119	78	59	45	27	12	15	35	49	59	77	96	104	180
Fort Plain	71	64	41	15	16	39	54	95	114	128	146	161	188	208	222	232	250	269	277	281
Frankfort	101	94	71	45	14	9	24	65	84	98	116	131	158	178	192	202	220	239	247	251
Fullman's Basin	245	238	215	189	158	135	120	79	60	46	28	13	14	34	48	58	76	95	103	170
Fultonville	56	49	26	.....	31	54	69	110	129	143	161	176	203	223	237	247	265	284	292	296
Fergusons	106	99	76	50	19	4	19	60	79	93	111	126	153	173	187	197	215	234	242	246
Gaine's Basin	295	288	265	239	208	185	170	129	110	96	78	63	36	16	2	8	26	15	53	57
Gasport	315	308	285	259	228	205	190	149	130	116	98	83	56	36	82	12	6	25	33	37
Geddes	168	161	138	112	81	58	143	2	17	31	49	64	91	111	125	135	153	172	180	184
Greece (Six-Mile Grocery)	266	259	236	210	179	156	141	160	81	67	49	34	7	13	27	37	55	74	82	86
Higginsville	135	128	105	79	48	25	10	31	50	64	82	97	124	144	158	168	186	205	213	217
Hindsburg	289	282	259	233	202	179	164	123	104	90	72	57	30	10	4	14	32	51	59	63
Hoffman's Ferry	40	33	10	16	47	70	85	126	145	159	177	192	219	239	253	263	281	300	308	312
Holley	284	277	254	228	197	174	159	118	99	85	67	52	25	5	9	19	37	56	64	68
Hulberton	287	280	257	231	200	177	162	121	102	88	70	55	28	8	6	16	34	53	61	65
Ilion	98	91	68	42	11	12	27	68	87	101	119	134	161	181	195	205	233	242	250	254
Jordan	185	178	155	129	98	75	60	19	.....	14	32	47	74	94	108	118	136	155	163	167
Junction	7	.....	123	49	80	103	148	159	178	192	210	235	252	274	286	296	314	333	341	345
Kirkville	155	148	125	99	68	45	30	11	30	44	62	57	101	132	138	148	166	185	193	197
Kappsville	241	234	211	185	154	131	116	75	56	42	24	9	18	38	52	62	80	99	107	111
Knowlesville	299	292	269	243	212	189	174	133	114	100	82	67	40	20	6	4	22	41	49	53
Lenox	143	136	113	87	56	33	18	23	42	56	74	89	116	136	150	160	178	197	205	209
Limestone Feeder	159	152	129	103	72	49	34	7	36	40	58	73	100	120	134	144	162	181	189	193
Little Falls	87	80	57	31	.....	23	38	79	98	112	130	145	172	192	206	216	334	253	261	265
Lock Berlin	214	207	184	158	127	104	89	48	29	15	3	18	45	65	79	89	107	126	134	138
Lockport	321	314	291	265	234	211	196	155	136	122	104	89	62	42	28	18	.....	19	27	31
Lockville	323	216	193	167	136	113	98	57	38	24	6	9	36	56	70	80	98	117	125	129
Lock No. 35	253	246	223	197	166	143	128	87	68	54	36	21	6	26	40	50	68	87	95	99
Lodi	165	158	135	109	78	55	40	1	20	34	52	67	94	114	128	138	156	175	183	187
Loomis	127	130	107	81	50	27	12	29	48	62	81	95	122	142	156	166	184	203	211	215
Lower Black Rock	348	341	318	292	261	238	223	182	163	149	131	116	89	69	55	45	27	8	....	4
Lyons	217	210	187	161	130	107	92	51	32	18	.....	15	42	62	76	86	104	123	131	135
Maybees	314	307	284	258	227	204	189	148	129	115	97	82	55	35	21	11	7	26	34	38
Macedon	236	229	206	180	149	126	111	70	51	37	19	4	23	43	57	67	85	104	112	116
Manlius	158	151	128	102	71	48	33	8	27	41	59	74	101	121	135	145	163	182	190	194
Martinsville	306	329	306	280	249	226	211	170	151	137	119	104	77	57	43	33	15	4	12	16
Medina	303	296	273	247	216	193	178	137	118	104	86	71	44	24	10	.....	18	37	45	49
Middleport	309	302	279	253	222	199	184	143	124	110	92	77	50	30	16	6	12	31	39	43
Millards	318	311	288	262	231	208	193	152	133	119	101	86	59	39	25	15	3	22	30	34
Mindenville	78	71	48	22	9	32	47	83	107	121	139	154	181	201	121	225	243	362	270	274
Mohawk	95	88	65	39	8	15	30	71	90	104	122	137	164	184	198	208	226	245	253	257
Montezuma	199	192	169	143	112	89	74	33	14	.....	18	33	60	80	94	104	122	141	149	153
Newark	224	217	194	168	137	114	99	58	39	25	7	8	35	69	69	79	97	116	124	128
New Boston Landing	149	142	119	93	62	39	24	17	26	50	68	83	110	130	144	154	172	191	199	203
New London	131	134	101	75	44	21	6	35	54	68	86	101	128	148	162	172	190	209	217	201
Nine-Mile Creek	174	157	144	118	87	64	49	8	11	25	43	58	85	105	119	129	147	166	174	178
Orangeport	316	309	286	260	229	206	191	150	131	117	99	84	57	37	23	13	5	24	32	36

ERIE CANAL — (*Concluded*).

NAMES OF PLACES.	Albany.	West Troy.	Schenectady.	Fultonville.	Little Falls.	Utica.	Rome.	Syracuse.	Jorhan.	Montezuma.	Lyons.	Palmyra.	Rochester.	Brockport.	Albion.	Medina.	Lockport.	Tonawanda.	Lower Black Rock.	Buffalo.
Oriskany	117	110	87	61	30	7	8	49	68	82	100	115	142	162	176	186	204	203	231	235
Orville Feeder	161	154	131	105	74	51	36	5	24	36	56	71	98	118	132	142	160	179	187	191
Palmyra	232	225	202	176	145	122	107	66	47	33	15	.....	27	47	61	71	79	108	116	120
Pendleton	328	321	298	272	241	218	203	162	143	129	111	96	69	49	35	25	7	12	20	24
Peru	182	175	152	126	95	72	57	16	3	17	35	50	77	97	111	121	139	158	166	170
Picardsville	333	326	303	277	246	223	208	167	148	134	116	101	74	54	40	30	12	7	15	19
Pitt Lock	205	198	175	149	118	85	80	39	20	6	12	27	54	74	88	98	116	135	143	14
Pittsford	251	244	221	195	164	141	126	85	66	52	34	19	8	28	42	52	70	89	97	101
Pool's Brook	154	147	124	98	67	44	29	12	31	45	63	78	105	125	139	149	167	186	194	198
Port Byron	194	187	164	138	107	84	69	28	9	5	23	38	65	85	99	109	127	146	154	158
Port Gibson	227	220	197	171	140	117	102	61	42	28	10	5	32	52	66	76	94	113	121	125
Port Jackson	46	39	16	10	41	64	79	120	139	153	171	186	213	233	247	257	275	294	302	306
Reynale's Basin	313	306	283	257	226	203	188	147	128	114	96	81	54	34	20	10	8	27	35	39
Rochester	259	252	229	203	172	149	134	93	74	60	42	27	.....	20	34	44	62	81	81	93
Rome	125	118	95	69	38	15	.....	41	60	74	92	107	134	154	168	178	196	215	223	227
Schenectady	30	23	.....	26	57	80	95	136	155	169	187	202	229	249	263	273	291	310	318	322
Schoharie Creek	51	44	21	5	36	59	74	115	134	148	166	181	208	228	242	252	270	289	297	301
Shelby Basin	306	299	276	250	219	196	181	140	121	107	89	74	47	27	13	3	15	34	42	46
Spencerport	271	264	241	215	184	161	146	105	86	72	54	39	12	8	22	32	50	69	77	81
Sprakers	65	58	35	9	22	45	60	101	120	134	152	167	194	214	228	238	256	275	283	287
St. Johnsville	76	69	46	20	11	34	49	90	109	123	141	156	183	203	217	227	245	264	272	276
Sulphur Spring G Lock	326	319	296	270	239	216	201	160	141	127	109	94	67	47	33	23	5	14	22	26
Syracuse	166	159	135	110	79	56	41	.....	19	33	51	63	93	113	127	137	156	174	182	186
Tonawanda	140	333	310	284	253	230	315	172	155	141	123	108	81	61	47	37	19	.....	8	12
Upper Aqueduet	26	19	4	30	61	84	99	140	159	173	191	206	233	253	267	277	295	314	322	326
Utica	110	103	80	54	23	.....	15	56	75	89	107	122	149	169	163	193	211	230	230	242
Wayneport	239	232	209	183	152	129	114	73	54	40	22	7	20	40	54	64	82	101	109	113
Weedsport	190	183	160	134	103	80	65	24	5	9	27	42	69	89	103	113	131	150	158	162
West Troy	7	.....	23	49	80	103	118	159	178	192	210	225	252	272	286	296	314	333	341	345
Whitesboro	114	107	84	58	27	4	11	52	71	85	103	118	145	165	179	189	207	226	234	23
Yatesville	62	55	32	6	25	48	63	104	123	137	155	170	197	217	231	241	259	278	286	29
York Mills	113	106	83	57	26	3	12	53	72	86	104	119	146	166	180	190	208	227	235	239

CHAMPLAIN CANAL.

NAMES OF PLACES.	DISTANCE FROM—		
	Place to place.	Albany.	Whitehall.
Albany	....	....	73
West Troy	7	7	66
Junction	....	7	66
Waterford	3	12	61
Mechanicville	8	20	53
Stillwater Village	4	24	49
Bleecker's Basin	2	26	47
Wilbur's Basin	2	28	45
Van Dusen's Landing	5	33	40
Schuylerville	3	36	37
Saratoga bridge	2	38	35
Fort Miller	3	41	32
Moses Kill	3	44	29
Fort Edward	5	49	24
Glens Falls feeder	2	51	22
Baker's Basin	1	52	21
Smith's Basin	5	57	16
Fort Ann	4	61	12
Comstock's Landing	4	65	8
Whitehall	8	73	....

GLENS FALLS FEEDER — CHAMPLAIN CANAL.

NAMES OF PLACES.	Distance from place to place.
Champlain canal	....
Sandy Hill	2
Glens Falls	3
Head of the feeder	2
Head of the pond	5
From Junction to Whitehall	66
Length of Glens Falls feeder	12
Length of pond above Troy dam	3
Total	81

OSWEGO CANAL.

NAMES OF PLACES.	DISTANCE FROM—		
	Place to place.	Syracuse.	Oswego.
Syracuse	....	....	38
Salina	2	2	36
Liverpool	3	5	33
Mud Lock	2	7	31
Cold Spring	1	8	30
New Bridge	5	13	25
Three River Point	2	15	23
Phoenix	2	17	21
Sweet's Lock	3	20	18
Ox Creek	2	23	15
Fulton	4	27	11
Braddock's Rapid	4	31	7
Tiffany's Landing	4	35	8
High Dam	1	36	2
Oswego	2	38	....

CAYUGA AND SENECA CANAL.

NAMES OF PLACES.	DISTANCE FROM—		
	Place to place.	Montezuma.	Geneva.
Montezuma	....	....	21
Seneca river	5	5	16
South Dermott	2	7	14
Seneca Falls	3	10	11
Chamberlain's Mills	2	12	9
Waterloo	2	14	7
Teal's	5	19	2
Geneva	2	21	0
Lateral canal to East Cayuga village, two miles	2	....	....

ONEIDA LAKE CANAL AND FEEDER.

Extends from Erie canal at Higgins, four miles west of New London, to the Oneida lake, as follows:

Canal proper, from Higgins to Wood creek	3¾
Wood creek, with a towing path to the Oneida creek	2¼

BLACK RIVER CANAL.

NAMES OF PLACES.	DISTANCE FROM—		
	Place to place.	Rome.	Boonville.
Rome	....	....	25
Ridge Mills	2	2	23
Lock No. 7	3	5	20
Walworth's Storehouse	1	6	19
Westernville	3	9	16
Wells Brook Aqueduct	2	11	14
Stringers' Creek	2	13	12
Lansing Hill	1	14	11
Lock No. 31	2	16	9
Lansing Kill dam or feeder	1	17	8
Lower Falls, Lansing Kill	2	19	6
Upper Falls, Lansing Kill	2	21	4
Lock No. 70	2	23	2
Boonville	2	25	....
Sugar river	3	28	3
Little Falls, Black river	1	29	4
Port Leyden	3	32	7
Lock No. 91	1	33	8
Lyon Falls	2	35	10
Hawkinsville, on feeder (three miles from Boonville)	....	28	3
A. Lee's on feeder	2	30	5
R. B. Miller's on feeder	1	31	6
State dam on feeder	4	35	10
Head of reservoir	2	37	12

ONEIDA RIVER IMPROVEMENT.

Names of places.	Distance from place to place.
Three River Point	....
Peter Scott creek	4
Oak Orchard	4
Caughdenoy	7
Brewerton	5

GENERAL SUMMARY.

	Miles.
Erie canal	352
Albany basin	1
Feeders	8
	361

	Miles
Champlain canal	66
Glens Falls feeder	12
Pond above Troy dam	3
	81
Black River canal	35
Black River feeder and reservoir	12
Black River improvement	42
	89
Oneida Lake canal feeder	7
Oswego canal	38
Baldwinsville side cut	1
Oneida river improvement	20
Seneca river towing path	5¾
Seneca river improvement	12¼

Report made to the Superintendent of Public Works by the Inspectors appointed under the Steam Navigation Law.

DEPARTMENT OF PUBLIC WORKS,

BUREAU OF NAVIGATION.

ALBANY, *December* 29, 1910.

Hon. F. C. Stevens, Superintendent of Public Works, Albany, N. Y.:

DEAR SIR.—Pursuant to the provisions of the Navigation Law, we respectfully submit our report with the operations of the Bureau of Navigation for the year 1910:

Licenses.

Master's first issue	10	
Master's renewals	62	
		72
Pilot's first issue	38	
Pilot's renewals	54	
		92
Pilots and Engineers' first issue	78	
Pilots and Engineers' renewals	137	
		215
Engineer's first issue	55	
Engineer's renewals	112	
		167
Total		546

Steam vessels inspected and certificated	88
Motor vessels inspected and certificated	208
Vessels inspected and not certificated, waiting for affidavits	24

Number of vessels found deficient and ordered repaired..	201
Certificates withheld waiting for affidavits............	86
Number of vessels withdrawn and out of commission....	73
Fees collected and paid to Supt. of Public Works........	$4,260

We are pleased to report no fatal casualties during the year and we think the service has been of great benefit to the public for whom it was intended.

Respectfully submitted,
W. S. VAN KEUREN,
G. C. WEHLING,
Inspectors of Steam Vessels.

REPORT

OF THE

SUPERINTENDENT OF PUBLIC WORKS

UPON THE

TRADE AND TONNAGE OF THE CANALS FOR THE YEAR 1910

ANNUAL ACCOUNT *of property (in tons of* 2,000 *lbs.) shipped on the canals each week during the season of* 1910.

DAYS.	THE FOREST — PRODUCT OF WOOD.						
	Boards and scantling.	Shingles.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Fifteenth to twenty-second	25,826	....	10	378	1,607	193	453
Twenty-third to close	21,060	....	....	....	8,977	408	56
Total May	46,886	....	10	378	10,584	601	509
First to Seventh	18,681	....	....	1,554	5,191	....	553
Eighth to Fourteenth	11,922	....	490	504	3,254	110	....
Fifteenth to Twenty-second	11,239	....	460	140	6,168	99	499
Twenty-third to close	23,314	....	....	3,074	12,922	70	235
Total June	65,156	....	950	5,272	27,535	279	1,287
First to Seventh	14,111	....	....	....	7,347	197	588
Eighth to fourteenth	17,762	....	....	840	6,031	....	....
Fifteenth to twenty-second	16,589	....	....	....	13,227	505	224
Twenty-third to close	18,605	....	....	3,010	21,988	45	....
Total July	67,067	....	....	3,850	48,593	747	812

First to seventh	15,580	....	300	....	5,538	127	473
Eighth to fourteenth	11,533	....	200	....	5,704	127	955
Fifteenth to twenty-second	14,161	....	....	280	9,055	48	25
Twenty-third to close	21,220	....	80	3,416	15,344	1,548	552
Total August	62,494	....	580	3,696	35,641	1,850	2,005
First to seventh	13,400	....	....	....	5,832	1,109	....
Eighth to fourteenth	16,397	50	....	....	8,618	3,682	732
Fifteenth to twenty-second	13,082	....	....	280	8,660	812	585
Twenty-third to close	21,974	....	....	1,960	13,507	197	491
Total September	64,853	50	....	2,240	36,617	5,800	1,808
First to seventh	13,084	....	....	....	4,228	1,434	154
Eighth to fourteenth	13,687	....	....	....	3,261	785	728
Fifteenth to twenty-second	17,424	....	....	280	759	2,733	492
Twenty third to close	20,197	....	....	6,720	6,462	5,098	515
Total October	64,392	....	....	7,000	14,710	10,050	1,889

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	THE FOREST — PRODUCT OF WOOD.						
	Boards and scantling.	Shingles.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
First to seventh	15,716	....	....	....	1,464	792	....
Eighth to fifteenth	31,718	....	....	1,960	2,027	2,791	1,435
Total November	47,434	....	....	1,960	3,491	3,583	1,435
Total for the year	418,282	50	1,540	24,396	177,171	22,910	9,745

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	AGRICULTURE—PRODUCT OF ANIMALS.		AGRICULTURE—VEGETABLE FOOD.				
	Lard, tallow and lard oil.	Hides.	Flour.	Wheat.	Rye.	Corn.	Barley.
Fifteenth to twenty-second	....	....	....	6,966	476	1,243	1,440
Twenty-third to close	25	....	....	2,163	....	1,288	228
Total May	25	....	....	9,129	476	2,531	1,668
First to seventh	22	....	....	3,101	....	1,806	480
Eighth to fourteenth	21	....	....	5,826	....	3,396	1,666
Fifteenth to twenty-second	....	....	....	7,893	....	5,058	1,186
Twenty-third to close	....	....	....	5,105	720	10,400	240
Total June	43	....	....	21,925	720	20,660	3,572
First to seventh	....	....	....	2,199	....	5,599	....
Eighth to fourteenth	....	....	....	3,576	....	5,743	....
Fifteenth to twenty-second	38	....	....	2,461	1,184	10,055	....
Twenty-third to close	120	....	....	1,914	....	10,243	....
Total July	158	....	....	10,150	1,184	31,640	....

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	AGRICULTURE—PRODUCT OF ANIMALS.		AGRICULTURE—VEGETABLE FOOD.				
	Lard, tallow and lard oil.	Hides.	Flour.	Wheat.	Rye.	Corn.	Barley.
First to seventh	....	....	....	2,637	....	9,360	480
Eighth to fourteenth	....	....	8	6,576	....	7,434	960
Fifteenth to twenty-second	....	....	....	14,112	....	5,870	2,146
Twenty-third to close	69	....	....	14,500	....	2,885	1,440
Total August	69	....	8	37,825	....	25,549	5,026
First to seventh	....	....	....	9,953	....	2,366	2,160
Eighth to fourteenth	20	10	....	5,274	....	3,349	1,440
Fifteenth to twenty-second	....	6	6	8,414	....	5,638	1,912
Twenty-third to close	23	....	....	13,735	....	5,401	4,258
Total September	43	16	6	37,376	....	16,754	9,770

First to seventh	....	....	....	8,781	....	8,281	2,611
Eighth to fourteenth	....	....	....	12,222	....	5,684	4,620
Fifteenth to twenty-second	....	....	....	10,082	....	3,742	6,691
Twenty-third to close	....	....	....	9,185	....	2,184	3,295
Total October	....	....	....	40,270	....	19,891	17,217
First to seventh	56	....	....	10,541	....	3,441	2,405
Eighth to fifteenth	....	....	....	12,034	....	2,724	4,782
Total November	56	....	....	22,575	....	6,165	7,187
Total for the year	394	16	14	179,250	2,380	123,190	44,440

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	AGRICULTURE — VEGETABLE FOOD.						
	Barley malt.	Oats.	Bran and ship stuffs.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
Fifteenth to twenty-second	639	6,215	....	23	....	....	32
Twenty-third to close	672	3,848	....	1	....	....	....
Total May	1,311	10,063	....	24	....	....	32
First to seventh	847	6,707	....	....	....	....	....
Eighth to fourteenth	1,658	2,699	....	....	....	....	60
Fifteenth to twenty-second	1,300	2,307	....	....	....	....	....
Twenty-third to close	1,842	2,521	....	....	....	....	....
Total June	5,647	14,234	....	....	....	....	60
First to seventh	238	2,259	....	....	....	....	....
Eighth to fourteenth	1,046	3,781	....	....	....	....	18
Fifteenth to twenty-second	648	2,668	....	....	....	....	30
Twenty-third to close	663	1,967	....	....	....	....	....
Total July	2,595	10,675	....	....	....	....	48

First to seventh	1,061	2,797	....	....	....	....	....
Eighth to fourteenth	660	1,721	....	....	....	....	....
Fifteenth to twenty-second	627	1,184	....	1	....	....	77
Twenty-third to close	....	2,074	....	....	....	....	1
Total August	2,348	7,776	....	1	....	....	78
First to-seventh	1,046	2,404	....	....	....	....	80
Eighth to fourteenth	....	2,178	....	1	....	....	....
Fifteenth to twenty-second	643	5,253	10	....	....	....	....
Twenty-third to close	....	4,308	....	....	....	....	....
Total September	1,689	14,143	10	1	....	....	80
First to seventh	....	4,619	....	....	....	....	....
Eighth to fourteenth	238	3,171	....	....	....	....	....
Fifteenth to twenty-second	....	6,371	....	....	....	....	....
Twenty-third to close	....	5,892	....	2	....	264	56
Total October	238	20,053	....	2	....	264	56

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	AGRICULTURE — VEGETABLE FOOD.						
	Barley malt.	Oats.	Bran and ship stuffs.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
First to seventh	471	4,018	50	....	....	3,102	....
Eighth to fifteenth	476	3,446	....	....	568	3,254	....
Total November	947	7,464	50	....	568	6,356	....
Total for the year	14,775	84,408	60	28	568	6,620	354

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	All Other Agricultural Products.			
	Hemp.	Clover and grass seed.	Flax seed.	Hay.
Fifteenth to twenty-second	696	70	2,301	337
Twenty-second to close	15	44	2,678	1,481
Total May	711	114	4,979	1,818
First to seventh	....	....	....	92
Eighth to fourteenth	602	25	336	292
Fifteenth to twenty-second	225	20	3,240	200
Twenty-third to close	163	....	1,247	385
Total June	990	45	4,823	969
First to seventh	....	....	761	202
Eighth to fourteenth	....	....	356	682
Fifteenth to twenty-second	43	....	151	471
Twenty-third to close	....	....	....	567
Total July	43	....	1,268	1,922

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	ALL OTHER AGRICULTURAL PRODUCTS.			
	Hemp.	Clover and grass seed.	Flax seed.	Hay.
First to seventh	770	....	....	285
Eighth to fourteenth	162	....	....	....
Fifteenth to twenty-second	16	....	....	577
Twenty-third to close	922	....	....	569
Total August	1,870	....	....	1,431
First to seventh	1	....	....	295
Eighth to fourteenth	....	....	....	846
Fifteenth to twenty-second	....	53	....	1,009
Twenty-third to close	18	2	....	1,112
Total September	19	55	....	3,262
First to seventh	283	52	....	868
Eighth to fourteenth	....	22	....	1,771
Fifteenth to twenty-second	5	33	....	1,469
Twenty-third to close	....	....	....	1,709
Total October	288	107	....	5,817

First to seventh	11	20	....	1,880
Eighth to fifteenth	....	....	....	3,605
Total November	11	20	....	5,485
Total for the year	3,932	341	11,070	20,704

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	MANUFACTURES.								
	Domestic spirits.	Furniture.	Pig iron.	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic cottons.	Domestic salt.	Foreign salt.
Fifteenth to twenty-second	75	......	......	......	22	108	......	3,556	....
Twenty-third to close	251	......	......	62	2	......	......	8,962	....
Total May	326	......	......	62	24	108	......	12,518	....
First to seventh	62	......	1,966	......	......	......	......	5,724	....
Eighth to fourteenth	192	......	2,507	......	......	......	......	1,591	....
Fifteenth to twenty-second	50	......	2,480	......	......	......	......	5,892	....
Twenty-third to close	......	......	1,681	......	......	......	......	9,590	....
Total June	304	......	8,634	......	......	......	......	22,797	....
First to seventh	76	......	1,317	......	476	......	1	4,265	....
Eighth to fourteenth	......	......	......	......	78	......	2	3,772	....
Fifteenth to twenty-second	129	......	2,156	75	73	......	......	7,791	....
Twenty-third to close	45	......	4,359	......	403	......	......	5,409	....
Total July	250	......	7,832	75	1,030	......	3	21,237	....

First to seventh	......	......	235	......	......	......	......	7,203	......
Eighth to fourteenth	74	......	......	......	336	......	......	6,446	......
Fifteenth to twenty-second	32	......	2,742	......	......	......	62	9,388	168
Twenty-third to close	......	2	1,059	......	......	......	......	4,527	......
Total August	106	2	4,036	......	336	......	62	27,564	168
First to seventh	......	......	1,342	......	......	......	......	1,172	......
Eighth to fourteenth	......	......	......	......	......	......	......	1,865	......
Fifteenth to twenty second	......	......	470	......	......	......	......	4,776	......
Twenty third to close	5	......	230	......	85	......	......	1,951	......
Total September	5	......	2,042	......	85	......	......	9,764	......
First to seventh	......	......	841	......	12	......	......	3,332	......
Eighth to fourteenth	......	......	231	150	......	......	......	1,890	......
Fifteenth to twenty-second	18	......	1,616	168	......	......	......	3,886	......
Twenty-third to close	5	......	224	......	336	......	......	2,619	......
Total October	23	......	2,912	318	348	......	......	11,727	......

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	MANUFACTURES.								
	Domestic spirits.	Furniture.	Pig iron.	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic cottons.	Domestic salt.	Foreign salt.
First to seventh	......	......	1,974	......	......	......	......	967	....
Eighth to fifteenth	......	......	3,735	......	......	......	......	4,043	....
Total November	......	......	5,709	......	......	......	......	5,010	....
Total for the year	1,014	2	31,165	455	1,823	108	65	110,617	168

Annual account of property (in tons) shipped, etc.— (Continued).

Days.	Merchandise.						
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.	Ice.
Fifteenth to twenty-second	4,447	42	197	....	45	8,851	....
Twenty-third to close	1,146	4	62	487	....	5,820	....
Total May	5,593	46	259	487	45	14,671	....
First to seventh	1,029	33	52	....	....	6,847	560
Eighth to fourteenth	1,741	....	78	....	....	4,048	1,960
Fifteenth to twenty-second	2,679	2	92	415	....	5,922	1,120
Twenty-third to close	1,879	....	30	83	....	9,800	17,410
Total June	7,328	35	252	498	....	26,617	21,050
First to seventh	509	....	28	....	....	6,217	1,825
Eighth to fourteenth	806	....	....	70	5	4,044	2,240
Fifteenth to twenty-second	931	26	66	....	....	5,846	2,240
Twenty-third to close	1,112	....	3	....	....	12,347	14,840
Total July	3,358	26	97	70	5	28,454	21,145

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	MERCHANDISE.						
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.	Ice.
First to seventh	2,487	....	125	190	....	6,162	1,400
Eighth to fourteenth	1,354	....	75	100	....	4,003	1,120
Fifteenth to twenty-second	932	26	194	....	....	7,021	1,400
Twenty-third to close	1,125	39	121	162	....	12,945	7,000
Total August	5,898	65	515	452	....	30,131	10,920
First to seventh	548	39	56	314	1	6,444	840
Eighth to fourteenth	470	....	33	227	25	5,295	560
Fifteenth to twenty-second	331	....	198	101	....	5,139	1,490
Twenty-third to close	1,014	69	156	150	....	10,755	12,305
Total September	2,363	108	443	792	26	27,633	15,195

First to seventh	426	27	39	568	....	8,400	1,120
Eighth to fourteenth	843	5	18	....	1	5,606	560
Fifteenth to twenty-second	2,307	196	119	204	....	8,709	280
Twenty-third to close	1,118	219	197	....	....	12,959	280
Total October	4,694	447	373	772	1	35,674	2,240
First to seventh	611	45	157	150	....	8,402	2,800
Eighth to Fifteenth	423	18	....	....	....	7,414	....
Total November	1,034	63	157	150	....	15,816	2,800
Total for the year	30,268	790	2,096	3,221	77	178,996	73,350

Annual account of property (in tons) shipped, etc.— (Continued).

DAYS.	OTHER ARTICLES.							
	Stone, lime and clay.	Phosphates.	MINERAL COAL.		Iron ore.	Sundries.	Total tons.	Total miles boats cleared.
			Anthracite.	Bituminous.				
Fifteenth to twenty-second...	27,157	536	29,968	4,795	....	2,043	130,747	106,102
Twenty-third to close.......	29,605	335	23,461	4,148	336	1,352	118,977	60,153
Total May.............	56,762	871	53,429	8,943	336	3,395	249,724	166,255
First to seventh............	19,972	160	24,674	3,296	766	547	104,722	52,430
Eighth to fourteenth........	18,495	....	17,127	3,261	1,551	2,090	87,502	61,040
Fifteenth to twenty-second..	29,140	1,099	12,921	3,384	134	1,490	106,854	70,738
Twenty-third to close.......	50,337	640	23,816	4,674	....	1,195	183,373	83,327
Total June.............	117,944	1,899	78,538	14,615	2,451	5,322	482,451	267,535
First to seventh............	40,122	....	18,648	5,725	1,167	1,582	115,459	58,725
Eighth to fourteenth........	26,903	....	6,171	2,842	607	1,013	88,388	47,964
Fifteenth to twenty-second..	32,878	2,256	5,119	4,369	....	524	112,773	72,511
Twenty-third to close.......	68,765	1,849	11,085	7,054	470	645	187,508	87,571
Total July.............	168,668	4,105	41,023	19,990	2,244	3,764	504,128	266,771

First to seventh	54,521	200	10,680	11,275	....	505	134,391	61,217
Eighth to fourteenth	29,062	....	3,709	4,029	1,697	964	89,009	50,842
Fifteenth to twenty-second	31,508	336	3,234	3,626	1,053	258	110,159	68,577
Twenty-third to close	82,210	....	6,267	6,248	1,422	846	188,593	94,764
Total August	197,301	536	23,890	25,178	4,172	2,573	522,152	275,400
First to seventh	36,017	307	6,373	13,972	812	358	107,241	58,657
Eighth to fourteenth	26,162	....	2,120	4,361	168	424	84,307	42,654
Fifteenth to twenty-second	31,620	....	2,738	5,760	3,489	844	103,319	64,440
Twenty-third to close	79,193	844	11,001	5,102	3,175	753	193,774	104,115
Total September	172,992	1,151	22,232	29,195	7,644	2,379	488,641	269,866
First to seventh	37,967	1,034	8,251	12,128	2,134	972	121,646	77,624
Eighth to fourteenth	33,963	690	3,590	6,399	....	470	100,605	64,241
Fifteenth to twenty-second	35,358	680	4,404	6,196	347	533	115,102	80,814
Twenty-third to close	97,600	392	10,874	8,749	454	686	198,291	86,037
Total October	204,888	2,796	27,119	33,472	2,935	2,661	535,644	308,716

Annual account of property (in tons) shipped, etc.— (Concluded).

DAYS.	OTHER ARTICLES.							
	Stone, lime and clay.	Phosphates.	MINERAL COAL.		Iron ore.	Sundries.	Total tons.	Total miles boat cleared.
			Anthracite.	Bituminous.				
First to seventh	29,786	....	11,445	15,562	....	63	115,929	64,111
Eighth to fifteenth	40,147	2,813	27,026	16,368	840	1,096	174,743	88,971
Total November	69,933	2,813	38,471	31,930	840	1,159	290,672	153,082
Total for the year	988,488	14,171	284,702	163,323	20,622	21,253	3,073,412	1,707,625

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs) of way freight going east during the season of* 1910.

OFFICES.	The Forest — Product of Wood.					
	Boards and scantling.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	3,322					
West Troy	856		36		225	
Rome			1,596			
Syracuse	340					8,051
Rochester	2,850					
Tonawanda	76,258					
Buffalo	112,717					
Waterford	22,500		7,938			
Whitehall	25,936	580	13,272	141,595	11,675	
Oswego	33			35,327		
Waterloo						
Boonville	5		154			
Total	244,817	580	22,996	176,922	11,900	8,051

Way freight (in tons) going east, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.				
	Flour.	Wheat.	Corn.	Barley.	Barley malt.
Albany	....	....	....	....	....
West Troy	....	....	....	....	....
Rome	....	....	....	....	....
Syracuse	14	1,243	....	....	1,632
Rochester	....	....	15,802	....	....
Tonawanda	....	....	....	....	....
Buffalo	....	43,694	59,625	15,605	....
Waterford	....	....	....	....	....
Whitehall	....	....	....	....	....
Oswego	....	....	....	....	....
Waterloo	....	....	....	....	....
Boonville	....	....	....	....	....
Total	14	44,937	75,427	15,605	1,632

Way freight (in tons) going east, etc.— (Concluded).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.				
	Oats.	Bran and ship stuffs.	Apples.	Potatoes.	Hay.
Albany	....	....	....	....	....
West Troy	....	....	....	....	4,677
Rome	....	....	....	792	....
Syracuse	24	60	....	392	14
Rochester	....	....	....	....	....
Tonawanda	....	....	....	....	....
Buffalo	31,848	....	....	....	....
Waterford	....	....	284	3,405	550
Whitehall	....	....	....	....	....
Oswego	....	....	....	....	....
Waterloo	....	....	....	....	....
Boonville	....	....	....	792	....
Total	31,872	60	284	5,381	5,241

Way freight (in tons) going east, etc.— (Continued).

OFFICES.	MANUFACTURES.				MERCHANDISE.		
	Furniture.	Pig iron.	Castings and iron ware.	Domestic salt.	Iron and steel.	Flint, enamel, Crockery and glassware.	All other merchandise.
Albany	....	....	....	....	....	....	350
West Troy	....	....	73	....	....	....	....
Rome	....	....	....	....	....	....	6,294
Syracuse	2	....	....	71,241	280	51	16,250
Rochester	....	....	....	24,249	....	....	5,833
Tonawanda	....	....	78	....	....	....	....
Buffalo	....	1,142	....	....	501	....	9,568
Waterford	....	....	....	....	....	....	7,682
Whitehall	....	....	....	....	....	....	....
Oswego	....	....	....	....	....	....	12
Waterloo	....	....	....	14,949	....	....	2,155
Boonville	....	....	....	....	....	....	....
Total	2	1,142	151	110,439	781	51	48,144

Way freight (in tons) going east, etc.— (Concluded).

OFFICES	OTHER ARTICLES.						Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Sundries.	
Albany	....	....	....	....	....	....	3,672
West Troy	53,480	19,486	....	90	....	200	79,123
Rome	....	81,778	....	29,304	23,002	....	142,766
Syracuse	18,195	12,578	....	25,132	18,716	2,528	176,743
Rochester	....	20,106	160	8,961	18,730	....	96,691
Tonawanda	....	41,057	....	....	920	....	118,313
Buffalo	....	282,135	....	....	1,890	685	559,410
Waterford	1,125	37,547	....	....	....	2,585	83,616
Whitehall	....	10,670	....	....	....	....	203,728
Oswego	....	....	....	....	....	....	35,372
Waterloo	....	....	....	120	21,667	....	38,891
Boonville	....	145,160	....	....	....	....	146,111
Total	72,800	650,517	160	63,607	84,925	5,998	1,684,436

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs.) of way freight going west during the season of* 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.					
	Boards and scantling.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	4,578					
West Troy	7,878	500			508	345
Rome			1,400			
Syracuse	2,241					856
Rochester	133	460				
Tonawanda						
Buffalo						
Waterford	583				6,490	
Whitehall				252		
Oswego						
Waterloo	50					
Boonville						
Total	15,463	960	1,400	252	6,998	1,201

Way freight (in tons) going west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.					
	Product of animals — Lard, tallow and lard oil.	Barley.	Oats.	Peas and Beans.	Apples.	Dried fruit.
Albany						
West Troy	43		8	4		41
Rome						
Syracuse		8,604				
Rochester						
Tonawanda					14	
Buffalo						
Waterford		960				
Whitehall						
Oswego						
Waterloo						
Boonville						
Total	43	9,564	8	4	14	41

Way freight (in tons) going west, etc.— (Continued).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.			MANUFACTURES.			
	Hemp.	Clover and grass seed.	Hay.	Domestic spirits.	Bloom and bar iron.	Castings and iron ware.	Domestic cottons.
Albany							
West Troy	9	2		15		1,553	65
Rome							
Syracuse			105				
Rochester							
Tonawanda							
Buffalo							
Waterford					75		
Whitehall							
Oswego							
Waterloo							
Boonville							
Total	9	2	105	15	75	1,553	65

Way freight (in tons) going west, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany						
West Troy	10,531	185	69	1,623	1	6,609
Rome						20,975
Syracuse				20		17,752
Rochester						6,878
Tonawanda						
Buffalo						
Waterford				300		9,035
Whitehall						
Oswego						
Waterloo						
Boonville						
Total	10,531	185	69	1,943	1	61,249

Way freight (in tons) going west, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.							Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany	....	403	....	248	....	....	....	5,229
West Troy	560	61,897	13,394	46,753	260	1,793	2,510	157,156
Rome	....	94,553	....	9,725	10,059	....	....	136,712
Syracuse	....	10,644	....	18,932	25,162	....	1,204	85,520
Rochester	....	22,767	....	1,435	2,584	....	....	34,257
Tonawanda	....	20,880	....	....	....	....	....	20,894
Buffalo	....	....	....	....	....	....	....	....
Waterford	....	12,607	....	47,700	26,640	....	305	104,695
Whitehall	....	12,675	....	....	....	....	....	12,927
Oswego	....	23,660	....	....	....	....	....	23,660
Waterloo	....	....	....	1,474	1,222	....	....	2,746
Boonville	....	....	....	....	....	....	....	....
Total	560	260,086	13,394	126,267	65,927	1,793	4,019	583,796

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs.) of way freight going east and west during the season of* 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.					
	Boards and scantling.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	7,900	....	....	....	....	....
West Troy	8,734	500	36	....	733	345
Rome	....	....	2,996	....	....	....
Syracuse	2,581	....	....	....	....	8,970
Rochester	2,983	460	....	....	....	....
Tonawanda	76,258	....	....	....	....	....
Buffalo	112,717	....	....	....	....	....
Waterford	23,083	....	7,938	....	6,490	....
Whitehall	25,936	580	13,272	141,847	11,675	....
Oswego	33	....	....	35,327	....	....
Waterloo	50	....	....	....	....	....
Boonville	5	....	154	....	....	....
Total	260,280	1,540	24,396	177,174	18,898	9,252

Way freight (in tons) going east and west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.					
	Product of animals — Lard, tallow and lard oil.	Flour.	Wheat.	Corn.	Barley.	Barley malt.
Albany						
West Troy	43					
Rome						
Syracuse		14	1,243		8,604	1,632
Rochester				15,802		
Tonawanda						
Buffalo			43,694	59,625	15,605	
Waterford					960	
Whitehall						
Oswego						
Waterloo						
Boonville						
Total	43	14	44,937	75,427	25,169	1,632

Way freight (in tons) going east and west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.					
	Oats.	Bran and ship stuffs.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
Albany						
West Troy	8		4			41
Rome					792	
Syracuse	24	60			392	
Rochester						
Tonawanda				14		
Buffalo	31,848					
Waterford				284	3,405	
Whitehall						
Oswego						
Waterloo						
Boonville					792	
Total	31,880	60	4	298	5,381	41

Way freight (in tons) going east and west, etc.— (Continued).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.			MANUFACTURES.	
	Hemp.	Clover and grass seed.	Hay.	Domestic spirits.	Furniture.
Albany					
West Troy	9	2	4,677	15	
Rome					
Syracuse			119		2
Rochester					
Tonawanda					
Buffalo					
Waterford			550		
Whitehall					
Oswego					
Waterloo					
Boonville					
Total	9	2	5,346	15	2

Way freight (in tons) going east and west, etc.— (Continued).

OFFICES.	MANUFACTURES.				
	Pig iron.	Bloom and bar iron.	Castings and iron ware.	Domestic cottons.	Domestic salt.
Albany	....	....	....	....	....
West Troy	....	....	1,626	65	....
Rome	....	....	....	....	....
Syracuse	....	....	....	....	71,241
Rochester	....	....	....	....	24,249
Tonawanda	....	....	78	....	....
Buffalo	1,142	....	....	....	....
Waterford	....	75	....	....	....
Whitehall	....	....	....	....	....
Oswego	....	....	....	....	....
Waterloo	....	....	....	....	14,949
Boonville	....	....	....	....	....
Total	1,142	75	1,704	65	110,439

Way freight (in tons) going east and west, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany						350
West Troy	10,531	185	69	1,623	1	6,609
Rome						27,269
Syracuse				300	51	34,002
Rochester						12,711
Tonawanda						
Buffalo				501		9,568
Waterford				300		16,717
Whitehall						
Oswego						12
Waterloo						2,155
Boonville						
Total	10,531	185	69	2,724	52	109,393

Way freight (in tons) going east and west, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.							Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany	....	403	....	248	....	....	....	8,901
West Troy	54,040	81,383	13,394	46,843	260	1,793	2,710	236,279
Rome	....	176,331	....	39,029	33,061	....	....	279,478
Syracuse	18,195	23,222	....	44,064	43,878	....	3,732	262,263
Rochester	....	42,873	160	10,396	21,314	....	....	130,948
Tonawanda	....	61,937	....	....	920	....	....	139,207
Buffalo	....	282,135	....	....	1,890	....	685	559,410
Waterford	1,125	50,154	....	47,700	26,640	....	2,890	188,311
Whitehall	....	23,345	....	....	....	....	....	216,655
Oswego	....	23,660	....	....	....	....	....	59,032
Waterloo	....	....	....	1,594	22,889	....	....	41,637
Boonville	....	145,160	....	....	....	....	....	146,111
Total	73,360	910,603	13,554	189,874	150,852	1,793	10,017	2,268,232

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs.) of through freight going east during the season of* 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.		AGRICULTURE — VEGETABLE FOOD.			
	Boards and scantling.	Shingles.	Wheat.	Rye.	Corn.	Barley.
Tonawanda	59,588	....	....	....	....	....
Buffalo	....	....	134,312	2,380	47,762	19,270
Whitehall	97,262	50	....	....	....	....
Total	156,850	50	134,312	2,380	47,762	19,270

Through freight (in tons) going east, etc.— (Continued).

OFFICES.	Agriculture — Vegetable Food.				All other agricultural products — Hay.
	Barley malt.	Oats.	Apples.	Potatoes.	
Tonawanda					
Buffalo	13,143	52,528			
Whitehall			270	1,239	15,357
Total	13,143	52,528	270	1,239	15,357

Through freight (in tons) going east, etc.— (Concluded).

OFFICES.	Manufactures — Pig iron.	MERCHANDISE.		OTHER ARTICLES.			Total tons.
		Iron and steel.	All other merchandise.	Stone, lime and clay.	Iron ore.	Sundries.	
Tonawanda	8,772	....	....	....	....	....	68,360
Buffalo	21,252	....	....	224	....	16	290,887
Whitehall	....	162	731	....	18,829	1,061	134,961
Total	30,024	162	731	224	18,829	1,077	494,208

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs.) of through freight going west during the season of* 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			AGRICULTURE — PRODUCT OF ANIMALS.	
	Boards and scantling.	Wood pulp.	Ashes, pot and pearl.	Lard, tallow and lard oil.	Hides.
Albany	200	....	....	....	....
West Troy	462	3,051	492	351	16
Waterford	488	961	....	....	....
Total	1,150	4,012	492	351	16

Through freight (in tons) going west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.		ALL OTHER AGRICULTURAL PRODUCTS.		
	Peas and beans.	Dried fruit.	Hemp.	Clover and grass seed.	Flax seed.
Albany	....	....	....	....	....
West Troy	23	311	3,922	339	11,070
Waterford	....	....	....	....	....
Total	23	311	3,922	339	11,070

Through freight (in tons) going west, etc.— (Continued).

OFFICES.	MANUFACTURES.					
	Domestic spirits.	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic salt.	Foreign salt.
Albany	....	....	....	....	....	....
West Troy	1,000	62	120	108	....	....
Waterford	....	318	....	....	177	168
Total	1,000	380	120	108	177	168

Through freight (in tons) going west, etc.— (Continued).

OFFICES.	MERCHANDISE					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany	....	....	....	....	....	90
West Troy	19,736	605	2,026	143	25	60,590
Waterford	....	....	....	190	....	8,194
Total	19,736	605	2,026	333	25	68,874

Through freight (in tons) going west, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.					Total tons.
	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Sundries.	
Albany	371	....	....	....	179	840
West Troy	51,123	616	....	....	9,841	166,032
Waterford	26,447	....	94,545	12,472	140	144,100
Total	77,941	616	94,545	12,472	10,160	310,972

ANNUAL STATEMENT *showing the total quantity (in tons of 2,000 lbs.) of through freight going east and west during the season of* 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.				AGRICULTURE — PRODUCT OF ANIMALS.	
	Boards and scantling.	Shingles.	Wood pulp.	Ashes, pot and pearl.	Lard, tallow and lard oil.	Hides.
Albany	200	....	....	....	....	....
West Troy	462	....	3,051	492	351	16
Tonawanda	59,588	....	....	....	....	....
Buffalo	....	....	....	....	....	....
Waterford	488	....	961	....	....	....
Whitehall	97,262	50	....	....	....	....
Total	158,000	50	4,012	492	351	16

Through freight (in tons) going east and west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.				
	Wheat.	Rye.	Corn.	Barley.	Barley malt.
Albany	....	....	....	....	....
West Troy	....	....	....	....	....
Tonawanda	....	....	....	....	....
Buffalo	134,312	2,380	47,762	19,270	13,143
Waterford	....	....	....	....	....
Whitehall	....	....	....	....	....
Total	134,312	2,380	47,762	19,270	13,143

Through freight (in tons) going east and west, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.				
	Oats.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
Albany					
West Troy		23			311
Tonawanda					
Buffalo	52,528				
Waterford					
Whitehall			270	1,239	
Total	52,528	23	270	1,239	311

Through freight (in tons) going east and west, etc.— (Continued).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.			
	Hemp.	Clover and grass seed.	Flax seed.	Hay.
Albany	....	....	....	....
West Troy	3,922	339	11,070	....
Tonawanda	....	....	....	....
Buffalo	....	....	....	....
Waterford	....	....	....	....
Whitehall	....	....	....	15,357
Total	3,922	339	11,070	15,357

Through freight (in tons) going east and west, etc.— (Continued).

OFFICES.	MANUFACTURES.						
	Domestic spirits.	Pig iron.	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic salt.	Foreign salt.
Albany	....	....	....	....	....	....	....
West Troy	1,000	....	62	120	108	....	....
Tonawanda	....	8,772	....	....	....	....	....
Buffalo	....	21,252	....	....	....	....	....
Waterford	....	....	318	....	....	177	168
Whitehall	....	....	....	....	....	....	....
Total	1,000	30,024	380	120	108	177	168

Through freight (in tons) going east and west, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany	....	....	....	....	....	90
West Troy	19,736	605	2,026	143	25	60,590
Tonawanda	....	....	....	....	....	....
Buffalo	....	....	....	....	....	....
Waterford	....	....	....	190	....	8,194
Whitehall	....	....	....	162	....	731
Total	19,736	605	2,026	495	25	69,605

Through freight (in tons) going east and west, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.						Total tons.
	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany	371	....	....	....	....	179	840
West Troy	51,123	616	....	....	....	9,841	166,032
Tonawanda	....	....	....	....	....	....	68,360
Buffalo	224	....	....	....	....	16	290,887
Waterford	26,447	....	94,545	12,472	....	140	144,100
Whitehall	....	....	....	....	18,829	1,061	134,961
Total	78,165	616	94,545	12,472	18,829	11,237	805,180

Total tons carried on the canals during the season of 1910.

Offices.	The Forest — Product of Wood.						
	Boards and scantling.	Shingles.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	8,100						
West Troy	9,196		500	36		3,784	837
Rome				2,996			
Syracuse	2,581						8,907
Rochester	2,983		460				
Tonawanda	135,846						
Buffalo	112,717						
Waterford	23,571			7,938		7,451	
Whitehall	123,198	50	580	13,272	141,847	11,675	
Oswego	33				35,327		
Waterloo	50						
Boonville	5			154			
Total	418,280	50	1,540	24,396	177,174	22,910	9.744

Total tons carried on the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — PRODUCT OF ANIMALS.		AGRICULTURE — VEGETABLE FOOD.				
	Lard, tallow and lard oil.	Hides.	Flour.	Wheat.	Rye.	Corn.	Barley.
Albany							
West Troy	394	16					
Rome							
Syracuse			14	1,243			8,604
Rochester						15,802	
Tonawanda							
Buffalo				178,006	2,380	107,387	34,875
Waterford							960
Whitehall							
Oswego							
Waterloo							
Boonville							
Total	394	16	14	179,249	2,380	123,189	44,439

Total tons carried on the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.						
	Barley malt.	Oats.	Bran and ship stuffs.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
Albany							
West Troy		8		27			352
Rome						792	
Syracuse	1,632	24	60			392	
Rochester							
Tonawanda					14		
Buffalo	13,143	84,376					
Waterford					284	3,405	
Whitehall					270	1,239	
Oswego							
Waterloo							
Boonville						792	
Total	14,775	84,408	60	27	568	6,620	352

Total tons carried on the canals, etc.—(Continued).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.				MANUFACTURES.		
	Hemp.	Clover and grass seed.	Flax seed.	Hay.	Domestic spirits.	Furniture.	Pig iron.
Albany							
West Troy	3,931	341	11,070	4,677	1,015		
Rome							
Syracuse				119		2	
Rochester							
Tonawanda							8,772
Buffalo							22,394
Waterford				550			
Whitehall				15,357			
Oswego							
Waterloo							
Boonville							
Total	3,931	341	11,070	20,703	1,015	2	31,166

Total tons carried on the canals, etc. — (Continued).

OFFICES.	MANUFACTURES.					
	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic cottons.	Domestic salt.	Foreign salt.
Albany						
West Troy	62	1,746	108	65		
Rome						
Syracuse					71,241	
Rochester					24,249	
Tonawanda		78				
Buffalo						
Waterford	393				177	168
Whitehall						
Oswego						
Waterloo					14,949	
Boonville						
Total	455	1,824	108	65	110,616	168

Total tons carried on the canals, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany						440
West Troy	30,267	790	2,095	1,766	26	67,199
Rome						27,269
Syracuse				300	51	34,002
Rochester						12,711
Tonawanda						
Buffalo				501		9,568
Waterford				490		24,911
Whitehall				162		731
Oswego						12
Waterloo						2,155
Boonville						
Total	30,267	790	2,095	3,219	77	178,998

Total tons carried on the canals, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.							Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany	....	774	....	248	....	....	179	9,741
West Troy	54,040	132,506	14,010	46,843	260	1,793	12,551	402,311
Rome	....	176,331	....	39,029	33,061	....	....	279,478
Syracuse	18,195	23,222	....	44,064	43,878	....	3,732	262,263
Rochester	....	42,873	160	10,396	21,314	....	....	130,948
Tonawanda	....	61,937	....	....	920	....	....	207,567
Buffalo	....	282,359	....	....	1,890	....	701	850,297
Waterford	1,125	76,601	....	142,245	39,112	....	3,030	332,411
Whitehall	....	23,345	....	....	....	18,829	1,061	351,616
Oswego	....	23,660	....	....	....	....	....	59,032
Waterloo	....	....	....	1,594	22,889	....	....	41,637
Boonville	....	145,160	....	....	....	....	....	146,111
Total	73,360	988,768	14,170	284,419	163,324	20,622	21,254	3,073,412

Value of all property carried on the canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.						
	Boards and scantling.	Shingles.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	$145,790						
West Troy	165,513		$6,750	$52		$75,682	$30,440
Rome				4,280			
Syracuse	46,470						323,890
Rochester	53,700		6,210				
Tonawanda	2,445,238						
Buffalo	2,028,900						
Waterford	424,290			11,340		149,020	
Whitehall	2,217,571	$1,400	7,830	18,960	$780,159	233,504	
Oswego	600				194,300		
Waterloo	900						
Boonville	90			220			
Total	$7,529,062	$1,400	$20,790	$34,852	$974,459	$458,206	$354,330

Value of all property carried on the canals, etc.— (Continued).

OFFICES.	Agriculture — Product of Animals.		Agriculture — Vegetable Food.				
	Lard, tallow and lard oil.	Hides.	Flour.	Wheat.	Rye.	Corn.	Barley.
Albany	....	....	....	....	....	....	....
West Troy	$62,992	$4,480	....	....	....	....	....
Rome	....	....	....	....	....	....	....
Syracuse	....	....	$645	$44,738	....	....	$286,800
Rochester	....	....	....	....	....	$316,020	....
Tonawanda	....	....	....	....	....	....	....
Buffalo	....	....	....	6,408,216	$68,000	2,147,754	1,162,520
Waterford	....	....	....	....	....	....	32,000
Whitehall	....	....	....	....	....	....	....
Oswego	....	....	....	....	....	....	....
Waterloo	....	....	....	....	....	....	....
Boonville	....	....	....	....	....	....	....
Total	$62,992	$4,480	$645	$6,452,954	$68,000	$2,463,774	$1,481,320

Value of all property carried on the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.						
	Barley malt.	Oats.	Bran and ship stuffs.	Peas and beans.	Apples.	Potatoes.	Dried fruit.
Albany							
West Troy		$185		$2,218			$70,560
Rome						$13,200	
Syracuse	$86,400	$555	$1,500			6,525	
Rochester							
Tonawanda					$700		
Buffalo	695,680	1,951,204					
Waterford					14,000	56,750	
Whitehall					13,300	20,648	
Oswego							
Waterloo							
Boonville						13,200	
Total	$782,080	$1,951,944	$1,500	$2,218	$28,000	$110,323	$70,560

Value of all property carried on the canals, etc.— (Continued).

OFFICES.	ALL OTHER AGRICULTURAL PRODUCTS.				MANUFACTURES.		
	Hemp.	Clover and grass seed.	Flax seed.	Hay.	Domestic spirits.	Furniture.	Pig iron.
Albany							
West Troy	$628,992	$101,727	$442,800	$93,548	$317,024		
Rome							
Syracuse				2,382		$400	
Rochester							
Tonawanda							$131,580
Buffalo							335,908
Waterford				11,000			
Whitehall				307,136			
Oswego							
Waterloo							
Boonville							
Total	$628,992	$101,727	$442,800	$414,066	$317,024	$400	$467,488

Value of all property carried on the canals, etc.— (Continued).

OFFICES.	MANUFACTURES.					
	Bloom and bar iron.	Castings and iron ware.	Domestic woolens.	Domestic cottons.	Domestic salt.	Foreign salt.
Albany						
West Troy	$1,848	$104,748	$107,750	$39,090		
Rome						
Syracuse					$712,418	
Rochester					242,492	
Tonawanda		4,704				
Buffalo						
Waterford	10,290				1,770	$1,680
Whitehall						
Oswego						
Waterloo					149,497	
Boonville						
Total	$12,138	$109,452	$107,750	$39,090	$1,106,177	$1,680

Value of all property carried on the canals, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Flint, enamel, crockery and glassware.	All other merchandise.
Albany	....	....	....	....	....	$52,800
West Troy	$3,026,715	$47,418	$419,130	$70,666	$10,400	8,063,826
Rome	....	....	....	....	....	3,272,258
Syracuse	....	....	....	12,000	20,400	4,080,259
Rochester	....	....	....	....	....	1,525,320
Tonawanda	....	....	....	....	....	....
Buffalo	....	....	....	20,040	....	1,148,160
Waterford	....	....	....	19,600	....	2,989,140
Whitehall	....	....	....	6,496	....	87,702
Oswego	....	....	....	....	....	1,440
Waterloo	....	....	....	....	....	258,600
Boonville	....	....	....	....	....	....
Total	$3,026,715	$47,418	$419,130	$128,802	$30,800	$21,479,505

Value of all property carried on the canals, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.							Total value.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany	....	$1,935	....	$1,238	....	....	$21,458	$223,221
West Troy	$135,100	331,265	$140,104	234,211	$650	$8,966	1,506,066	16,250,916
Rome	....	440,830	....	195,148	82,654	....	....	4,008,370
Syracuse	45,488	56,513	....	220,319	109,690	....	447,810	6,505,202
Rochester	....	107,182	1,600	51,980	53,284	....	....	2,357,788
Tonawanda	....	154,844	....	....	2,300	....	....	2,739,366
Buffalo	....	734,133	....	....	4,914	....	84,144	16,789,573
Waterford	2,813	191,504	....	711,224	97,779	....	362,920	5,087,120
Whitehall	....	58,363	....	....	....	94,147	127,316	3,974,532
Oswego	....	59,149	....	....	....	....	....	255,489
Waterloo	....	7,970	....	57,224	....	....	....	474,191
Boonville	....	362,900	....	....	....	....	....	376,410
Total	$183,401	$2,506,588	$141,704	$1,471,344	$351,271	$103,113	$2,549,714	$59,042,178

Property (in tons of 2,000 lbs.) left at and between offices on the canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.						
	Boards and scantling.	Shingles.	Timber.	Wood.	Pulp wood.	Wood pulp.	Ashes, pot and pearl.
Albany	42,236						
West Troy	31,845		490	36	225	508	8,050
Rome	1,250			2,030			
Syracuse	11,748			913			182
Rochester	13,827		460				
Tonawanda	60,983						
Buffalo	114,111					3,114	
Waterford	122,028	50		7,938		6,490	
Whitehall	27,408		580	13,272	141,847	12,796	
Oswego	33				35,327		
Waterloo	430						
Boonville							
Total	425,899	50	1,530	24,189	177,399	22,908	8,232

Property (in tons of 2,000 lbs.) left at and between offices on the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.						
	Product of animals — Lard, tallow and lard oil.	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.
Albany							
West Troy		135,003	2,380	48,758	19,510	16,902	52,365
Rome				1,659			1.903
Syracuse		1,243		250	18,168		24
Rochester		22,490		15,801	1,325		
Tonawanda							
Buffalo	303	6,780		46,396	2,400		29,376
Waterford					960		
Whitehall							
Oswego							
Waterloo				9,667			
Boonville							
Total	303	165,516	2,380	122,531	42,363	16,902	83,668

Property (in tons of 2,000 lbs.) left at and between offices on the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.				ALL OTHER AGRICULTURAL PRODUCTS.			
	Peas and beans.	Apples.	Potatoes.	Dried fruit.	Hemp.	Clover and grass seed.	Flax seed.	Hay.
Albany								70
West Troy	3		1,193	3	9	2		4,607
Rome			792					
Syracuse				1				121
Rochester								
Tonawanda								
Buffalo	22			350	2,357	268	11,125	
Waterford		554	4,644					15,668
Whitehall								
Oswego								
Waterloo								
Boonville								
Total	25	554	6,629	354	2,366	270	11,125	20,466

Property (in tons of 2,000 lbs.) left at and between offices on the canals, etc.— (Continued).

OFFICES.	MANUFACTURES.						
	Domestic spirits.	Pig iron.	Bloom and bar iron.	Castings and iron ware.	Domestic cottons.	Domestic salt.	Foreign salt.
Albany							
West Troy	6	29,388		1,704	64	73,909	
Rome						207	
Syracuse					1	35,787	
Rochester							
Tonawanda							
Buffalo	1,195						
Waterford			75				
Whitehall				119			513
Oswego							
Waterloo							
Boonville						160	
Total	1,201	29,388	75	1,823	65	110,063	513

Property (in tons of 2,000 lbs.) left at and between offices on the canals, etc.— (Continued).

OFFICES.	MERCHANDISE.					
	Sugar.	Molasses.	Coffee.	Iron and steel.	Railroad iron.	All other merchandise.
Albany	....	....	....	....	....	350
West Troy	3,144	38	13	1,473	....	1,869
Rome	560	....	....	....	....	28,848
Syracuse	2,334	....	17	280	....	33,585
Rochester	3,640	4	....	....	150	14,362
Tonawanda	....	....	....	....	....	....
Buffalo	17,206	560	1,827	205	....	60,534
Waterford	....	....	....	463	....	17,448
Whitehall	....	....	....	817	....	7,500
Oswego	....	....	....	....	....	12
Waterloo	....	....	....	....	....	2,130
Boonville	....	....	....	....	....	144
Total	26,884	602	1,857	3,238	150	166,782

Property (in tons of 2,000 lbs.) left at and between offices on the canals, etc.— (Concluded).

OFFICES.	OTHER ARTICLES							Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Bituminous coal.	Iron ore.	Sundries.	
Albany				248				42,904
West Troy	54,040	64,364	1,199	46,843	260		1,918	602,121
Rome		189,978		35,944	49,022	1,531		313,724
Syracuse	18,195	55,137		22,050	44,520		5,461	250,017
Rochester		49,128	9,122	11,044	9,343		39	150,735
Tonawanda		41,331			920			103,234
Buffalo		340,333	648				21,061	660,171
Waterford		50,154		47,700	26,640	20,631	3,903	325,346
Whitehall		49,714		93,844	10,949			359,359
Oswego		23,660						59,032
Waterloo		2,628		5,064	8,919			28,838
Boonville		105,599		20				105,923
Total	72,235	972,026	10,969	262,757	150,573	22,162	32,382	3,001,404

Property (in tons of 2,000 lbs.) arriving at tide-water from the Erie canal during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			
	Boards and scantling.	Wood.	Wood pulp.	Ashes, pot and pearl.
Albany	37,658	....	....	....
West Troy	25,405	36	225	8,050
Total	63,063	36	225	8,050

Property (in tons of 2,000 lbs.) arriving at tide-water from the Erie canal, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.						
	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.	Potatoes.
Albany	....	....	....	....	....	....	....
West Troy	135,003	2,380	48,758	19,510	16,902	52,357	1,193
Total	135,003	2,380	48,758	19,510	16,902	52,357	1,193

Property (in tons of 2,000 lbs.) arriving at tide-water from the Erie canal, etc.— (Continued).

OFFICES	All other agricultural products — Hay.	MANUFACTURES.			All other merchandise.
		Pig iron.	Castings and iron ware	Domestic salt.	
Albany	70				350
West Troy	4,607	29,388	151	73,909	290
Total	4,677	29,388	151	73,909	640

Property (in tons of 2,000 lbs.) arriving at tide-water from the Erie canal, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.					Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Sundries.	
Albany	....	....	....	....	....	38,078
West Troy	50,960	31,455	160	90	1,702	502,531
Total	50,960	31,455	160	90	1,702	540,609

Property (in tons of 2,000 lbs.) arriving at tide-water from the Champlain canal during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			AGRICULTURE — VEGETABLE FOOD.		All other agricultural products — Hay.
	Boards and scantling.	Shingles.	Wood.	Apples.	Potatoes.	
Waterford	121,445	50	7,938	554	4,644	15,668
Total	121,445	50	7,938	554	4,644	15,668

Property (in tons of 2,000 lbs.) arriving at tide-water from the Champlain canal, etc.— (Concluded).

OFFICES.	MERCHANDISE.		OTHER ARTICLES.			Total tons.
	Iron and steel.	All other merchandise.	Stone, lime and clay.	Iron ore.	Sundries.	
Waterford	163	8,413	37,547	20,631	3,598	220,651
Total	163	8,413	37,547	20,631	3,598	220,651

Property (in tons of 2,000 lbs.) arriving at tide-water from all canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.				
	Boards and scantling.	Shingles.	Wood.	Wood pulp.	Ashes, pot and pearl.
Albany	37,658	....	....	....	....
West Troy	25,405	....	36	225	8,050
Waterford	121,445	50	7,938	....	....
Total	184,508	50	7,974	225	8,050

Property (in tons of 2,000 lbs.) arriving at tide-water from all canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.							
	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.	Apples.	Potatoes.
Albany	....	....	....	....	....	....	....	....
West Troy	135,003	2,380	48,758	19,510	16,902	52,357	....	1,193
Waterford	....	....	....	....	....	....	554	4,644
Total	135,003	2,380	48,758	19,510	16,902	52,357	554	5,837

Property (in tons of 2,000 pounds) arriving at tide-water from all canals, etc.— (Continued).

OFFICES.	All other agricultural products — Hay.	MANUFACTURES.			MERCHANDISE.	
		Pig iron.	Castings and iron ware.	Domestic salt.	Iron and steel.	All other merchandise.
Albany	70	....	....	....	....	350
West Troy	4,607	29,388	151	73,909	....	290
Waterford	15,668	....	....	....	163	8,413
Total	20,345	29,388	151	73,909	163	9,053

Property (in tons of 2,000 pounds) arriving at tide-water from all canals, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.						Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Iron ore.	Sundries.	
Albany	....	....	....	....	....	....	38,078
West Troy	50,960	31,455	160	90	....	1,702	502,531
Waterford	....	37,547	....	....	20,631	3,598	220,651
Total	50,960	69,002	160	90	20,631	5,300	761,260

Value of all property left at tide-water from the canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.				
	Boards and scantling.	Shingles.	Wood.	Wood pulp.	Ashes, pot and pearl.
Albany	$624,014	....	....	....	....
West Troy	457,287	....	$52	$4,500	$292,740
Waterford	2,186,010	$1,400	11,340	....	....
Total	$3,267,311	$1,400	$11,392	$4,500	$292,740

Value of all property left at tide-water from the canals, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.							
	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.	Apples.	Potatoes.
Albany	....	....	....	....	....	....	....	....
West Troy	$4,860,131	$68,000	$975,162	$650,342	$894,825	$1,210,629	....	$19,875
Waterford	....	....	....	....	....	....	$27,300	77,400
Total	$4,860,131	$68,000	$975,162	$650,342	$894,825	$1,210,629	$27,300	$97,275

Value of all property left at tide-water from the canals, etc.— (Continued).

OFFICES.	All other agricultural products — Hay.	MANUFACTURES.			MERCHANDISE.	
		Pig iron.	Castings and iron ware.	Domestic salt.	Iron and steel.	All other merchandise.
Albany	$1,400	....	....	....	....	$42,000
West Troy	92,148	$440,823	$9,072	$739,090	....	34,800
Waterford	313,350	....	....	....	$6,500	1,009,500
Total	$406,898	$440,823	$9,072	$739,090	$6,500	$1,086,300

Value of all property left at tide-water from the canals. etc.— (Concluded).

OFFICES.	OTHER ARTICLES.						Total value.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Anthracite coal.	Iron ore.	Sundries.	
Albany	....	....	....	....	....	....	$667,414
West Troy	$127,400	$78,638	$1,600	$448	....	$204,264	11,161,826
Waterford	....	93,868	....	....	$103,153	431,760	4,261,581
Total	$127,400	$172,506	$1,600	$448	$103,153	$636,024	$16,090,821

Property (in tons of 2,000 lbs.) that went to New York from the Erie canal during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.		AGRICULTURE — VEGETABLE FOOD.			
	Boards and scantling.	Ashes, pot and pearl.	Wheat.	Rye.	Corn.	Barley.
Albany	3,322	....	....	....	....	....
West Troy	25,347	8,050	135,003	2,380	48,758	18,320
Total	28,669	8,050	135,003	2,380	48,758	18,320

Property (in tons of 2,000 lbs.) that went to New York from the Erie canal, etc.— (Continued).

OFFICES.	AGRICULTURE — VEGETABLE FOOD.			All other agricultural products — Hay.	MANUFACTURES.	
	Barley malt.	Oats.	Potatoes.		Pig iron.	Domestic salt.
Albany	....	....	....	70	....	....
West Troy	16,902	52,357	1,193	4,607	29,388	73,909
Total	16,902	52,357	1,193	4,677	29,388	73,909

Property (in tons of 2,000 lbs.) that went to New York from the Erie canal, etc.— (Concluded).

OFFICES.	All other merchandise.	OTHER ARTICLES.				Total tons.
		Ice.	Stone, lime and clay.	Rock and super-phosphate.	Sundries.	
Albany	350	....	....	....	....	3,742
West Troy	190	50,960	19,830	160	1,702	489,056
Total	540	50,960	19,830	160	1,702	492,798

Property (in tons of 2,000 lbs.) that went to New York from the Champlain canal during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			AGRICULTURE — VEGETABLE FOOD.		All other agricultural products — Hay.
	Boards and scantling.	Shingles.	Wood.	Apples.	Potatoes.	
Waterford	121,445	50	7,938	554	4,644	15,668
Total	121,445	50	7,938	554	4,644	15,668

Property (in tons of 2,000 lbs.) that went to New York from the Champlain canal, etc.— (Concluded).

OFFICES.	Merchandise.		Other Articles.			Total tons.
	Iron and steel.	All other merchandise.	Stone, lime and clay.	Iron ore.	Sundries.	
Waterford	163	8,413	37,547	20,631	3,598	220,651
Total	163	8,413	37,347	20,631	3,598	220,651

Property (in tons of 2,000 lbs.) that went to New York from all canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			
	Boards and scantling.	Shingles.	Wood.	Ashes, pot and pearl.
Albany	3,322	....	....	....
West Troy	25,347	....	....	8,050
Waterford	121,445	50	7,938	....
Total	150,114	50	7,938	8,050

Property (in tons of 2,000 lbs.) that went to New York from all canals, etc.— (Continued).

OFFICES.	Agriculture — Vegetable Food.							
	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.	Apples.	Potatoes.
Albany	....	....	....	....	....	....	....	....
West Troy	135,003	2,380	48,758	18,320	16,902	52,357	....	1,193
Waterford	....	....	....	....	....	....	554	4,644
Total	135,003	2,380	48,758	18,320	16,902	52,357	554	5,837

Property (in tons of 2,000 lbs.) that went to New York from all canals, etc.— (Concluded).

OFFICES.	All other agricultural products — Hay.	MANUFACTURERS.		MERCHANDISE.	
		Pig iron.	Domestic salt.	Iron and steel.	All other merchandise.
Albany	70	....	....	....	350
West Troy	4,607	29,388	73,909	....	190
Waterford	15,668	....	....	163	8,413
Total	20,345	29,388	73,909	163	8,953

Property (*in tons of 2,000 lbs.*) *that went to New York from all canals, etc.*— (Concluded).

OFFICES.	OTHER ARTICLES.					Total tons.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Iron ore.	Sundries.	
Albany	....	....	....	....	....	3,742
West Troy	50,960	19,830	160	....	1,702	489,056
Waterford	....	37,547	....	20,631	3,598	220,651
Total	50,960	57,377	160	20,631	5,300	713,449

Value of all the property that went to New York from the canals during the season of 1910.

OFFICES.	THE FOREST — PRODUCT OF WOOD.			
	Boards and scantling.	Shingles.	Wood.	Ashes, pot and pearl.
Albany	$5,979	....	....	....
West Troy	456,237	....	....	$292,740
Waterford	2,186,010	$1,400	$11,340	....
Total	$2,648,226	$1,400	$11,340	$292,740

Value of all the property that went to New York from the canals, etc.— (Continued).

OFFICES.	Agriculture — Vegetable Food.							
	Wheat.	Rye.	Corn.	Barley.	Barley malt.	Oats.	Apples.	Potatoes.
Albany	....	....	....	....	....	....	....	....
West Troy	$4,860,131	$68,000	$975,162	$610,662	$894,825	$1,210,629	....	$19,875
Waterford	....	....	....	....	....	....	$27,300	77,400
Total	$4,860,131	$68,000	$975,162	$610,662	$894,825	$1,210,629	$27,300	$97,275

Value of all the property that went to New York from the canals, etc.— (Continued).

OFFICES.	All other agricultural products — Hay.	MANUFACTURERS.		MERCHANDISE.	
		Pig iron.	Domestic salt.	Iron and steel.	All other merchandise.
Albany	$1,400	....	....	....	$42,000
West Troy	92,148	$440,823	$739,090	....	22,800
Waterford	313,350	....	....	$6,500	1,009,500
Total	$406,898	$440,823	$739,090	$6,500	$1,074,300

Value of all the property that went to New York from the canals, etc.— (Concluded).

OFFICES.	OTHER ARTICLES.					Total value.
	Ice.	Stone, lime and clay.	Rock and super-phosphate.	Iron ore.	Sundries.	
Albany	....	....	....	....	....	$49,379
West Troy	$127,400	$49,575	$1,600	....	$204,264	11,065,961
Waterford	....	93,868	....	$103,153	431,760	4,261,581
Total	$127,400	$143,443	$1,600	$103,153	$636,024	$15,376,921

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property cleared at Buffalo during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	112,717	$2,028,900
Wheat	178,006	6,408,216
Rye	2,380	68,000
Corn	107,387	2,147,754
Barley	34,875	1,162,520
Barley malt	13,143	695,680
Oats	84,376	1,951,204
Pig iron	22,394	335,908
Iron and steel	501	20,040
All other merchandise	9,568	1,148,160
Stone, lime and clay	282,359	734,133
Bituminous coal	1,890	4,914
Sundries	701	84,144
Total tons and value	850,297	$16,789,573

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property left at Buffalo during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	114,111	$2,054,006
Wood pulp	3,114	62,288
Wheat	6,780	244,080
Corn	46,396	1,325,600
Hemp	2,357	377,206
Clover and grass seed	268	80,519
Peas and beans	22	1,893
Barley	2,400	80,000
Lard, tallow and lard oil	303	48,482
Sugar	17,206	1,720,669
Molasses	560	33,645
Coffee	1,827	365,436
Iron and steel	205	8,198
Dried fruit	350	69,895
All other merchandise	60,534	7,264,123
Stone, lime and clay	340,333	884,868
Phosphate	648	6,480
Oats	29,376	689,320
Sundries	21,061	2,407,333
Domestic spirits	1,195	373,525
Flax seed	11,125	445,209
Total tons and value	660,171	$18,542,775

STATEMENT *showing the total quantity (in tons of 2,000 pounds) of property cleared on the Oswego canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	2,274	$40,950
Domestic salt	2,853	28,531
Barley	8,604	286,800
Pulp wood	35,327	194,300
All other merchandise	10,054	1,206,499
Stone, lime and clay	29,213	73,032
Anthracite coal	1,125	5,624
Sundries	2,186	262,346
Ice	18,195	45,488
Bituminous coal	228	566
Iron and steel	20	800
Total tons and value	110,079	$2,144,936

STATEMENT *showing the total quantity (in tons of 2,000 pounds) of property left on the Oswego canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	7,938	$142,897
Barley	8,604	286,800
Domestic salt	2,863	28,627
All other merchandise	9,374	1,124,899
Stone, lime and clay	29,803	74,506
Anthracite coal	1,125	5,624
Sundries	2,273	272,666
Pulp wood	35,327	194,300
Ice	18,195	45,488
Bituminous coal	228	569
Iron and steel	20	800
Total tons and value	115,750	$2,177,176

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property cleared on the Black River canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	5	$90
Wood	1,582	2,260
Potatoes	792	13,200
All other merchandise	10,601	1,272,089
Bituminous coal	5,221	13,054
Stone, lime and clay	157,210	393,026
Anthracite coal	585	2,926
Total tons and value	175,996	$1,696,645

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property left on the Black River canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Wood	1,862	$2,660
Domestic salt	160	1,600
All other merchandise	10,460	1,254,503
Stone, lime and clay	157,259	393,148
Furniture	....	....
Anthracite coal	515	2,576
Bituminous coal	6,082	15,206
Potatoes	792	13,200
Total tons and value	177,130	$1,682,893

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property cleared on the Cayuga and Seneca canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Wheat	1,243	$44,738
Boards and scantling	1,317	23,700
Domestic salt	33,429	334,301
All other merchandise	4,254	510,480
Anthracite coal	5,164	25,821
Bituminous coal	22,889	57,224
Stone, lime and clay	3,853	8,093
Corn	7,901	158,010
Sundries	26	3,120
Oats	24	555
Hay	25	500
Total tons and value	80,125	$1,166,542

STATEMENT *showing the total quantity (in tons of* 2,000 *pounds) of property left on the Cayuga and Seneca canal during the season of* 1910, *and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	430	$7,740
Wheat	1,243	44,738
Corn	9,667	193,346
All other merchandise	4,535	544,200
Stone, lime and clay	3,673	9,084
Anthracite coal	5,378	26,890
Bituminous coal	21,713	54,283
Domestic salt	32,914	329,139
Sundries	41	4,920
Oats	24	555
Hay	25	500
Total tons and value	79,643	$1,215,395

STATEMENT *showing the total quantity (in tons of 2,000 pounds) of property cleared at Whitehall during the season of 1910, and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	123,198	$2,217,571
Timber	580	7,830
Wood	13,272	18,960
Pulp wood	141,847	780,159
Apples	270	13,300
Potatoes	1,239	20,648
Hay	15,357	307,136
All other merchandise	731	87,702
Stone, lime and clay	23,345	58,363
Iron ore	18,829	94,147
Sundries	1,061	127,316
Wood pulp	11,675	233,504
Shingles	50	1,400
Iron and steel	162	6,496
Total tons and value	351,616	$3,974,532

STATEMENT *showing the total quantity (in tons of 2,000 pounds) of property left at Whitehall during the season of 1910, and the value of the same.*

ARTICLES.	Tons.	Value.
Boards and scantling	27,408	$493,345
Wood	13,272	18,960
Pulp wood	141,847	780,159
Foreign salt	513	5,130
Castings and Iron Ware	119	7,122
Wood pulp	12,796	255,924
All other merchandise	7,500	900,000
Stone, lime and clay	49,714	124,285
Anthracite coal	93,844	469,221
Bituminous coal	10,949	27,372
Iron and steel	817	32,680
Timber	580	7,830
Total tons and value	359,359	$3,122,028

ANNUAL STATEMENT *showing the total quantity of shipments of each article first cleared on the canal at and the total quantity of shipments of each article left from the canal at Whitehall from the 16th of May to the 15th of November,* 1910, *going to and coming from New York, Vermont and Canada.*

ARTICLES.	QUANTITY CLEARED.			
	Coming from Canada.	Coming from New York.	Coming from Vermont.	Total cleared.
THE FOREST.				
Product of wood:				
Boards and scantling (feet)	56,006,948	14,891,000	3,021,078	73,919,026
Shingles (M)	400	....	....	400
Timber (cubic feet)	....	29,000	....	29,000
Wood (cords)	....	4,740	....	4,740
Pulp wood (pounds)	280,390,300	3,304,000	....	283,694,300
Wood pulp (pounds)	23,350,400	....	....	23,350,400
AGRICULTURE.				
Vegetable food:				
Hay (pounds)	27,170,755	1,605,614	1,937,280	30,713,649
Apples (barrels)	....	....	3,800	3,800
Potatoes (bushels)	....	41,295	....	41,295
MERCHANDISE.				
Iron and steel (pounds)	....	....	324,800	324,800
All other merchandise (pounds)	376,470	1,085,230	....	1,461,700

Statement showing the total quantity of shipments of each article first cleared on canal, etc.— (Continued).

ARTICLES.	QUANTITY CLEARED.			
	Coming from Canada.	Coming from New York.	Coming from Vermont.	Total cleared.
Other articles:				
Stone, lime and clay (pounds)	....	36,290,400	10,400,000	46,690,400
Iron ore (pounds)	....	37,658,880	....	37,658,880
Sundries (pounds)	....	....	2,121,930	2,121,930

Statement showing the total quantity of shipments of each article first cleared on canal, etc.— (Concluded).

ARTICLES.	QUANTITY LEFT.			
	Going to Canada.	Going to New York.	Going to Vermont.	Total left.
THE FOREST.				
Product of wood.				
Boards and scantling (feet)	....	15,894,830	550,000	16,444,830
Timber (cubic feet)	....	29,000	....	29,000
Wood (cords)	....	4,740	....	4,740
Pulp wood (pounds)	....	283,694,300	....	283,694,300
Wood pulp (pounds)	....	25,592,400	....	25,592,400
MANUFACTURES.				
Castings and iron ware (pounds)	....	....	237,400	237,400
Foreign salt	672,000	....	354,000	1,026,000
MERCHANDISE.				
Iron and steel	336,000	1,298,000	....	1,634,000
All other merchandise (pounds)	12,794,000	394,000	1,812,000	15,000,000
Other articles.				
Stone, lime and clay (pounds)	48,679,800	48,846,000	1,902,400	99,428,200
Anthracite coal (pounds)	148,645,540	12,458,220	26,584,660	187,688,420
Bituminous coal (pounds)	2,064,000	5,064,200	14,769,760	21,897,960

The following statement shows the average lake and canal rates on wheat and corn since 1890.

YEAR.	Freight, Buffalo to New York.	Tolls.	Lake freight.
1890.	c. m. fr.	c. m. fr.	c. m. fr
Wheat, per bushel.......	3 8 7	Free.	1 9 8
Corn, per bushel.........	3 3 9	Free.	1 6 9
1891.			
Wheat, per bushel.......	3 5 3	Free.	....
Corn, per bushel.........	3 2 0	Free.	....
1892.			
Wheat, per bushel.......	3 4 4	Free.	2 2 1
Corn, per bushel.........	3 5 5	Free.	1 9 5
1893.			
Wheat, per bushel.......	4 6 5	....	1 6 6
Corn, per bushel.........	4 2 8	....	1 4 5
1894.			
Wheat, per bushel.......	3 1 3	....	1 2 4
Corn, per bushel.........	2 8 8	....	1 1 5
1895.			
Wheat, per bushel.......	2 2 0	....	1 8 0
Corn, per bushel.........	1 9 0	....	1 7 0
1896.			
Wheat, per bushel.......	3 7 0	....	1 6 0
Corn, per bushel.........	3 5 0	....	1 3 0
1897.			
Wheat, per bushel.......	1 8 4	....	1 2 5
Corn, per bushel.........	2 3 8	....	1 4 2
1898.			
Wheat, per bushel.......	2 8 7	....	1 6 9
Corn, per bushel.........	2 3 6	....	1 5 6
1899.			
Wheat, per bushel.......	2 9 2	....	2 5 0
Corn, per bushel.........	2 5 0	....	2 4 0
1900.			
Wheat, per bushel.......	2 5 1	....	1 8 2
Corn, per bushel.........	2 2 2	....	1 6 5

Average lake and canal rates on wheat and corn, etc.—(Conclu'd).

YEAR.	Freight, Buffalo to New York.	Tolls.	Lake freight.
1901.	c. m. fr.	c. m. fr.	c. m. fr.
Wheat, per bushel	3 4 6	....	1 7 6
Corn, per bushel	3 1 1	....	1 6 4
1902.			
Wheat, per bushel	3 7 3	....	1 5 0
Corn, per bushel	3 4 6	....	1 3 6
1903.			
Wheat, per bushel	4 0 3	....	1 4 0
Corn, per bushel	3 6 5	....	1 3 1
1904.			
Wheat, per bushel	3 1 4	....	1 5 0
Corn, per bushel	2 6 7	....	1 3 4
1905.			
Wheat, per bushel	3 8 7	....	1 6 4
Corn, per bushel	3 3 4	....	1 5 0
1906.			
Wheat, per bushel	4 2 4	....	1 6 7
Corn, per bushel	3 8 6	....	1 5 4
1907.			
Wheat, per bushel	5 0 7	....	1 5 4
Corn, per bushel	4 6 6	....	1 4 1
1908.			
Wheat, per bushel	5 0 0	....	1 1 0
Corn, per bushel	4 6 0	....	1 0 0
1909.			
Wheat, per bushel	3 9 0	....	1 2 7
Corn, per bushel	3 5 3	....	1 2 7
1910.			
Wheat, per bushel	4 0 8	....	1 0 6
Corn, per bushel	3 7 1	....	1 0 6

Average rate on wheat and corn by lake, from Chicago to Buffalo, during the season of 1910.

	Wheat.			Corn.		
May, per bushel	1	0		1	0	
June, per bushel	1	0		1	0	
July, per bushel	1	0		1	0	
August, per bushel	1	0		1	0	
September, per bushel	1	1	6	1	1	6
October, per bushel	1	1	3	1	1	3
November, per bushel	1	1	3	1	1	3
	c.	m.	fr.	c.	m.	fr.
Average	1	0	6	1	0	6

Average rate on wheat and corn by canal, from Buffalo, to New York, during the season of 1910.

	Wheat.			Corn.		
May, per bushel	4	3	3	3	9	6
June, per bushel	3	1	8	2	8	9
July, per bushel	3	0	0	2	7	5
August, per bushel	3	5	6	3	2	4
September, per bushel	4	5	0	4	1	3
October, per bushel	4	9	5	4	4	8
November, per bushel	5	0	0	4	5	0
	c.	m.	fr.	c.	m.	fr.
Average	4	0	8	3	7	1

The following statement shows the number of clearances issued at each office during the season of 1910.

Albany	50
West Troy	3,811
Rome	3,803
Syracuse	2,915
Rochester	1,559
Tonawanda	969
Buffalo	2,062
Waterford	2,248
Whitehall	2,440
Oswego	705
Waterloo	284
Boonville	2,911
Total	23,757

Receipts by all routes at New York, May 1 to November 30, 1910.

	Hudson.	Erie.	Pennsylvania.	D., L. & W.	West Shore.
Flour, barrels	414,858	495,389	691,776	353,013	1,278,398
Meal, barrels	150	13,988	5,352	205	873
Meal, sacks	208,293	22,647	53,436	67,105	198,698
Wheat, bushels	133,200	182,400	825,600	2,864,400	1,886,400
Corn, bushels	175,500	697,500	45,000	372,375	671,625
Oats, bushels	4,064,125	4,520,100	358,375	2,070,950	317,200
Barley, bushels	26,775	33,150	85,425	165,750	105,825
Rye, bushels	14,950	5,750	60,950	35,650	11,500
Malt, bushels	1,222,500	76,500	7,500	385,500	595,500
Peas, bushels	59,220	5,600	4,000	21,900	7,700
Total grain	5,696,270	5,521,000	1,386,850	5,916,525	3,595,750
Flour, bushels	1,866,861	2,229,250	3,112,992	1,588,559	5,752,791
Meal, bushels	417,186	101,246	128,280	135,030	400,888
Grand total	7,980,317	7,851,496	4,628,122	7,640,114	9,749,429
Per cent	13.08	12.87	7.59	12.53	15.98

Receipts by all routes at New York, etc. — (Continued).

	L. V. R. R.	B. & O. R. R.	Various.	Total rail.
Flour, barrels	1,400,997	141,785	207,958	4,984,174
Meal, barrels	....	31,293	....	51,861
Meal, sacks	110,135	114,778	400	775,492
Wheat, bushels	1,730,400	2,400	4,800	7,629,600
Corn, bushels	324,000	1,125	10,125	2,297,250
Oats, bushels	446,825	1,525	683,200	12,462,300
Barley, bushels	131,325	....	3,825	552,075
Rye, bushels	....	....	....	128,800
Malt, bushels	75,000	13,500	1,500	2,377,500
Peas, bushels	12,500	....	....	110,920
Total grain	2,720,050	18,550	703,450	25,558,445
Flour, bushels	6,304,486	638,033	935,811	22,428,783
Meal, bushels	220,270	354,728	800	1,758,428
Grand total	9,244,806	1,011,311	1,640,061	49,745,656
Per cent	15.15	1.66	2.68	81.54

Receipts by all routes at New York, etc.— (Concluded).

	River and coast.	Canal.	Total water.	Total rail and water.
Flour, barrels	18,176	....	18,176	5,002,350
Meal, barrels	....	....	....	51,861
Meal, sacks	....	....	....	775,492
Wheat, bushels	....	4,470,900	4,470,900	12,100,500
Corn, bushels	750	1,672,100	1,672,850	3,970,100
Oats, bushels	....	3,300,400	3,300,400	15,762,700
Barley, bushels	118,610	707,400	826,010	1,378,085
Rye, bushels	30,438	17,000	47,438	176,238
Malt, bushels	....	832,900	832,900	3,210,400
Peas, bushels	29,885	....	29,885	140,805
Total grain	179,683	11,000,700	11,180,383	36,738,828
Flour, bushels	81,792	....	81,792	22,510,575
Meal, bushels	....	....	....	1,758,428
Grand total	261,475	11,000,700	11,262,175	61,007,831
Per cent	0.43	18.03	18.46	100.00

Receipts by all routes at New York, January 1 to December 31, 1910.

	Hudson.	Erie.	Pennsylvania.	D., L. & W.	West Shore.
Flour, barrels	615,212	857,079	1,080,866	556,994	2,061,923
Meal, barrels	400	19,388	8,806	515	1,148
Meal, sacks	325,762	45,800	91,181	76,127	309,103
Wheat, bushels	202,800	250,800	1,128,000	4,965,600	2,534,400
Corn, bushels	385,875	2,889,000	626,625	444,375	5,833,125
Oats, bushels	7,074,475	7,620,425	454,450	2,580,300	462,075
Barley, bushels	35,700	93,075	177,225	386,325	220,575
Rye, bushels	49,450	12,650	69,000	35,650	73,600
Malt, bushels	1,813,500	147,000	13,500	484,500	952,500
Peas, bushels	121,715	8,475	8,500	47,600	19,500
Total grain	9,683,515	11,021,425	2,477,300	8,944,350	10,095,775
Flour, bushels	2,768,453	3,856,856	4,863,897	2,506,473	9,278,653
Meal, bushels	653,124	169,152	217,586	154,314	622,798
Grand total	13,105,092	15,047,433	7,558,783	11,605,137	19,997,226
Per cent	13.36	15.24	7.71	11.83	20.39

Receipts by all routes at New York, etc.— (Continued).

	L. V. R. R.	B. & O. R. R.	Various.	Total rail.
Flour, barrels	2,401,113	210,565	291,869	8,075,621
Meal, barrels	....	40,326	....	70,583
Meal, sacks	204,845	169,408	1,080	1,223,306
Wheat, bushels	2,852,400	3,600	4,800	11,942,400
Corn, bushels	382,500	9,000	39,375	10,609,875
Oats, bushels	699,975	1,525	921,100	19,814,325
Barley, bushels	149,175	....	3,825	1,065,900
Rye, bushels	....	....	....	240,350
Malt, bushels	231,000	22,500	1,500	3,666,000
Peas, bushels	21,400	....	....	227,190
Total grain	4,336,450	36,625	970,600	47,566,040
Flour, bushels	10,805,008	947,543	1,313,411	36,340,294
Meal, bushels	409,690	500,120	2,160	2,728,944
Grand total	15,551,148	1,484,288	2,286,171	86,635,278
Per cent	15.86	1.62	2.33	88.34

Receipts by all routes at New York, etc.— (Concluded).

	River and coast.	Canal.	Total water.	Total rail and water.
Flour, barrels	22,386	....	22,386	8,098,007
Meal, barrels	90	....	90	70,673
Meal, sacks	....	....	....	1,223,306
Wheat, bushels	....	4,470,900	4,470,900	16,413,300
Corn, bushels	3,525	1,672,100	1,675,625	12,285,500
Oats, bushels	500	3,300,400	3,300,900	23,115,225
Barley, bushels	274,443	707,400	981,843	2,047,743
Rye, bushels	30,438	17,000	47,438	287,788
Malt, bushels	....	832,900	832,900	4,498,900
Peas, bushels	31,585	....	31,585	258,775
Total grain	340,491	11,000,700	11,341,191	58,907,231
Flour, bushels	100,737	....	100,737	36,441,031
Meal, bushels	360	....	360	2,729,304
Grand total	441,588	11,000,700	11,442,288	98,077,566
Per cent	0.45	11.21	11.66	100.00

The following table shows the separate tonnage of the New York Central, the Erie railway and the canals each year since 1853.

YEAR.	New York Central.	Erie.	Canals.	Total.
1853	360,000	631,039	4,247,853	5,238,892
1854	549,804	743,250	4,165,862	5,458,916
1855	670,073	842,048	4,022,617	5,534,738
1856	776,112	943,215	4,116,084	5,835,409
1857	838,791	978,066	3,344,061	5,160,918
1858	765,407	816,954	3,665,192	5,247,553
1859	834,319	869,073	3,781,684	5,485,076
1860	1,028,183	1,139,554	4,650,554	6,817,951
1861	1,167,302	1,253,418	4,507,635	6,928,355
1862	1,387,433	1,632,955	5,598,785	8,619,173
1863	1,449,604	1,815,096	5,557,692	8,822,392
1864	1,557,148	2,170,798	4,852,941	8,580,887
1865	1,275,299	2,234,350	4,729,654	8,239,303
1866	1,602,197	3,242,792	5,775,220	10,620,209
1867	1,667,926	3,484,546	5,688,325	10,840,797
1868	1,846,599	3,908,243	6,442,225	12,197,067
1869	2,281,885	4,312,209	5,859,080	12,453,174
1870	4,122,000	4,852,505	6,173,769	15,148,274
1871	4,532,956	4,844,208	6,467,888	15,844,152
1872	4,393,965	5,564,274	6,673,370	16,631,609
1873	5,522,724	6,312,702	6,364,782	18,200,208
1874	6,114,678	6,364,276	5,804,588	18,283,542

1875	6,001,954	6,239,946	4,859,858	17,101,758
1876	6,803,680	5,972,818	4,172,129	16,948,627
1877	6,351,356	6,182,451	4,955,963	17,489,770
1878	7,695,413	6,150,568	5,171,320	19,017,301
1879	9,015,753	8,212,641	5,362,372	22,590,766
1880	10,533,038	8,715,892	6,457,556	25,706,486
1881	11,591,379	11,086,823	5,179,192	27,857,394
1882	11,330,393	11,895,238	5,467,423	28,693,054
1883	10,892,440	13,610,623	5,684,956	30,168,019
1884	10,212,418	11,071,938	5,009,488	26,293,844
1885	10,733,499	10,253,489	4,731,784	25,718,772
1886	12,636,485	18,668,238	5,293,982	36,598,705
1887	14,531,726	13,949,260	5,553,805	34,034,791
1888	15,162,812	15,174,009	4,942,948	35,279,769
1889	15,011,541	14,084,132	5,370,369	34,466,042
1890	16,108,441	16,269,656	5,246,102	37,624,199
1891	16,621,576	17,339,140	4,563,472	38,524,188
1892	20,721,752	18,334,716	4,281,995	43,338,463
1893	21,312,072	17,309,198	4,031,963	42,953,233
1894	18,728,592	15,305,260	3,882,560	37,916,412
1895	19,741,495	12,928,530	3,500,314	36,170,339
1896	22,123,617	22,562,243	3,714,894	48,400,754
1897	20,649,810	19,443,898	3,617,804	43,711,512
1898	23,403,439	22,547,529	3,360,063	49,311,031
1899	25,356,474	22,660,236	3,686,051	51,702,761
1900	37,586,496	26,501,104	3,345,941	65,433,541
1901	37,403,122	24,817,112	3,420,613	65,640,847
1902	42,552,586	26,248,575	3,274,610	72,075,771

Separate tonnage of the New York Central, the Erie railway and the canals, etc.— (Concluded).

YEAR.	New York Central.	Erie.	Canals.	Total.
1903	38,081,380	30,586,743	3,616,385	72,283,508
1904	36,379,655	28,992,293	3,138,547	68,510,495
1905	39,734,512	30,791,733	3,226,896	73,753,141
1906	43,268,731	35,434,584	3,540,907	82,244,222
1907	45,967,208	38,201,663	3,407,914	87,576,785
1908	41,980,236	32,860,498	3,051,877	77,892,611
1909	40,894,086	32,000,752	3,116,536	76,011,374
1910	46,642,539	37,630,297	3,073,412	87,346,248

The following table shows the losses or gains in the tonnage of the New York Central, the Erie railway and the canals each year since 1853, comparison being made with previous year.

YEAR.	NEW YORK CENTRAL.		ERIE.		CANALS.	
	Gain.	Loss.	Gain.	Loss.	Gain.	Loss.
1854	189,804		112,211			81,991
1855	120,269		19,798			143,245
1856	106,039		101,167		93,456	
1857	62,679		34,851			772,021
1858		73,284		161,112	321,131	
1859	68,912		53,119		116,492	
1860	193,864		270,481		868,530	
1861	139,119		113,864			142,579
1862	220,131		379,537		1,091,150	
1863	62,171		182,141			41,093
1864	107,544		355,702			704,751
1865		281,849	63,552			123,287
1866	326,898		1,008,442		1,045,566	
1867	65,729		241,754			86,895
1868	178,673		423,697		753,900	
1869	435,286		403,966			583,145
1870	1,840,115		540,296		314,689	
1871	410,056			8,297	294,119	
1872		138,091	720,066		205,482	
1873	1,128,759		748,430			308,588

Table showing the losses or gains in the tonnage of the New York Central, the Erie railway and the canals, etc.—(Concluded).

YEAR.	NEW YORK CENTRAL.		ERIE.		CANALS.	
	Gain.	Loss.	Gain.	Loss.	Gain.	Loss.
1874	591,954	....	51,574	....	....	560,194
1875	....	112,724	....	124,330	....	944,730
1876	801,726	....	....	267,128	....	687,729
1877	....	452,324	209,633	....	783,834	....
1878	1,344,057	....	....	31,833	215,357	....
1879	1,320,340	....	2,062,073	....	191,052	....
1880	1,517,285	....	503,251	....	1,095,284	....
1881	1,058,341	....	2,370,931	....	....	1,278,464
1882	....	260,986	808,415	....	228,231	....
1883	....	437,953	1,715,385	....	196,633	....
1884	....	806,022	2,608,975	....	....	654,568
1885	521,081	....	....	818,449	....	277,704
1886	1,902,936	....	8,414,750	....	562,198	....
1887	1,895,291	....	....	4,718,978	259,823	....
1888	631,086	....	1,224,749	....	....	610,857
1889	....	151,271	....	89,877	427,421	....
1890	1,096,900	....	1,185,524	....	....	124,267
1891	513,126	....	1,069,884	....	....	682,530
1892	4,100,176	....	995,576	....	....	281,477
1893	590,220	....	....	1,025,518	49,968	....

1894	....	2,583,480	....	2,003,938	....	449,403
1895	1,012,903	....	....	2,376,730	....	382,246
1896	2,382,122	....	9,633,712	....	214,580	....
1897	....	1,473,807	....	3,118,345	....	97,090
1898	2,753,629	....	3,103,631	....	....	257,741
1899	1,953,035	....	112,707	....	325,988	....
1900	12,230,022	....	1,840,868	....	....	340,110
1901	....	183,374	316,008	....	74,672	....
1902	5,149,464	....	1,431,463	....	....	146,003
1903	....	4,471,206	4,338,168	....	340,775	....
1904	....	1,701,725	....	1,594,450	....	476,838
1905	3,354,857	....	1,799,440	....	83,349	....
1906	3,534,219	....	4,642,851	....	314,011	....
1907	2,698,477	....	2,767,079	....	....	132,993
1908	....	3,986,972	....	5,341,165	....	356,037
1909	....	1,086,150	....	859,746	64,659	....
1910	5,748,453	....	5,629,545	....	....	43,124

The total tons coming to tide-water for each of the seventy-three years and the aggregate value thereof, in market as follows:

YEAR.	Tons.	Value.
1838	640,481	$23,038,510
1839	602,128	20,163,190
1840	699,012	23,213,573
1841	774,334	27,225,322
1842	666,626	22,751,013
1843	836,861	28,453,408
1844	1,019,094	34,183,167
1845	1,204,943	45,452,321
1846	1,362,319	51,105,256
1847	1,744,283	73,092,414
1848	1,447,905	50,883,907
1849	1,579,946	52,375,521
1850	2,033,863	55,474,637
1851	1,977,151	53,927,508
1852	2,234,822	66,833,102
1853	2,505,797	73,688,044
1854	2,223,743	72,120,681
1855	1,890,593	74,177,937
1856	2,123,469	74,286,735
1857	1,617,187	51,190,018
1858	1,985,142	61,536,061
1859	2,121,672	43,175,312
1860	2,854,877	78,798,617
1861	2,980,144	81,432,759
1862	3,402,709	111,176,568
1863	3,274,727	123,173,294
1864	2,805,257	145,609,202
1865	2,730,181	113,865,846
1866	3,305,607	131,801,477
1867	3,029,695	120,902,834
1868	3,240,806	136,446,582
1869	3,096,142	144,866,060
1870	3,156,302	105,517,020
1871	3,494,801	106,874,570
1872	3,647,944	107,086,362
1873	3,376,649	97,869,497
1874	3,123,112	107,976,476
1875	2,608,777	89,447,518
1876	2,426,182	73,893,878
1877	2,986,812	76,787,713
1878	3,637,101	78,563,710
1879	3,286,176	96,992,498
1880	4,067,402	143,572,991

Total tons coming to tide-water, etc.— (Concluded).

YEAR.	Tons.	Value.
1881	3,065,839	$68,785,451
1882	3,068,152	74,303,139
1883	2,892,176	66,219,034
1884	2,900,788	66,718,124
1885	2,715,219	55,130,473
1886	3,215,177	67,517,864
1887	3,158,923	71,755,221
1888	2,584,661	58,801,038
1889	2,623,836	62,780,410
1890	3,024,765	62,920,266
1891	2,286,855	57,340,280
1892	2,336,519	73,698,295
1893	2,565,845	77,217,815
1894	2,256,895	51,740,449
1895	1,603,745	34,122,010
1896	2,073,378	41,985,498
1897	1,878,218	30,493,208
1898	1,609,472	27,272,655
1899	1,665,217	28,019,204
1900	1,340,631	21,249,492
1901	1,306,714	23,807,093
1902	1,240,124	21,553,144
1903	1,158,539	19,282,983
1904	938,691	16,397,293
1905	1,070,343	18,243,618
1906	1,071,072	19,429,730
1907	869,621	18,667,341
1908	855,920	15,207,680
1909	794,007	15,860,858
1910	761,260	16,090,821

The tons of the total movement of articles on all the canals, from 1837 to 1910, both years inclusive, were as follows.

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total.
1837	618,741	208,043	81,735	94,777	168,000	1,171,296
1838	665,089	255,227	101,526	124,290	186,879	1,333,011
1839	667,551	266,052	11,968	132,286	257,826	1,435,713
1840 Genesee Valley canal opened	587,647	393,780	100,367	112,021	222,231	1,416,046
1841	645,548	391,905	127,896	141,054	215,258	1,521,661
1842	504,597	401,276	98,968	101,446	130,644	1,236,931
1843	687,184	455,797	124,277	119,209	126,972	1,513,439
1844	864,373	509,387	144,245	141,930	156,651	1,816,586
1845	881,774	555,160	160,638	151,450	228,543	1,977,565
1846	916,976	814,258	149,006	169,799	218,623	2,268,662
1847	1,086,056	1,092,946	176,448	224,890	287,812	2,869,810
1848	1,086,080	913,824	202,781	261,458	331,287	2,796,230
1849	1,104,940	1,020,259	203,990	255,455	310,088	2,894,732
1850	1,261,991	965,619	200,218	269,370	379,419	3,076,617
1851	1,393,698	1,125,264	222,529	365,404	475,838	3,582,733
1852	1,586,080	1,213,357	207,955	420,295	435,754	3,863,441
1853	1,821,525	1,150,924	230,036	458,327	587,041	4,247,853
1854	1,768,745	992,839	258,021	406,022	740,235	4,165,862
1855	1,534,493	1,047,344	281,873	374,402	784,064	4,022,617
1856	1,478,664	1,192,673	284,901	370,768	789,076	4,116,082
1857	1,364,002	767,370	232,803	222,954	756,932	3,344,061
1858	1,232,968	1,279,891	295,903	188,441	667,989	3,665,192
1859	1,542,035	816,784	299,421	211,182	912,262	3,781,684

1860	1,509,977	1,682,754	268,759	250,360	938,364	4,650,124
1861	1,052,392	2,144,373	280,256	135,096	895,518	4,507,635
1862	1,569,674	2,494,036	364,877	167,927	1,002,271	5,598,785
1863	1,628,688	2,236,075	319,432	172,278	1,201,219	5,557,692
1864	1,478,921	1,572,836	282,354	143,984	1,374,846	4,852,941
1865	1,467,315	1,696,091	281,832	154,968	1,129,448	4,729,654
1866	1,769,994	1,786,060	302,241	179,878	1,737,047	5,775,220
1867	1,744,252	1,438,517	320,844	319,880	1,964,832	5,688,325
1868	1,958,309	1,442,147	373,262	324,064	2,344,443	6,442,225
1869	1,855,930	1,314,071	342,239	268,970	2,077,870	5,859,080
1870	1,916,511	1,309,153	352,497	271,856	2,323,752	6,173,769
1871	1,941,297	1,863,868	336,288	288,428	2,038,007	6,467,888
1872	1,950,798	1,683,962	325,564	298,758	2,414,288	6,673,370
1873	1,582,072	1,750,418	267,820	172,990	2,591,482	6,364,782
1874	1,482,753	1,772,583	246,697	132,181	2,170,374	5,804,588
1875	1,250,546	1,311,613	275,731	110,141	1,911,827	4,859,858
1876	1,175,313	1,067,497	180,201	64,943	1,684,175	4,172,129
1877	1,312,526	1,522,317	184,218	83,010	1,853,892	4,955,963
1878	1,364,120	1,921,236	220,063	138,064	1,527,837	5,171,320
1879	1,368,849	1,850,347	255,303	237,071	1,650,802	5,362,372
1880	1,566,764	2,403,358	278,114	355,165	1,849,255	6,457,656
1881	1,652,543	1,171,400	250,961	325,775	1,778,513	5,179,192
1882	1,771,743	1,173,257	187,535	283,174	2,051,714	5,467,423
1883	1,828,643	1,394,581	242,649	310,844	1,887,339	5,664,056
1884	1,671,706	1,264,237	205,013	300,480	1,568,052	5,009,488
1885	1,595,632	1,108,711	194,714	220,237	1,612,490	4,731,784
1886	1,523,496	1,537,331	165,760	397,249	1,670,146	5,293,982
1887	1,529,809	1,590,509	212,216	378,734	1,842,537	5,553,805
1888	1,389,728	1,177,587	153,905	206,437	2,015,291	4,942,948

The tons of the total movement of articles on all the canals, etc.— (Concluded).

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total.
1889	1,567,311	1,330,231	161,074	262,818	2,048 935	5,370,369
1890	1,397,862	1,201,916	139,310	769,672	1,737,342	5,246,102
1891	1,206,986	1,171,192	109,387	250,083	1,825,824	4,563,472
1892	1,249,381	1,038,851	125,781	292,468	1,575,514	4,281,995
1893	1,030,604	1,544,146	66,892	216,013	1,474,308	4,331,963
1894	872,601	1,412,142	87,241	352,741	1,157,835	3,882,560
1895	974,870	644,009	133,911	251,537	1,495,987	3,500,314
1896	852,467	1,136,665	152,322	270,603	1,302,837	3,714,894
1897	896,971	789,783	152,388	250,872	1,527,790	3,617,804
1898	820,668	707,855	175,632	220,107	1,435,801	3,360,063
1899	838,449	620,908	159,413	260,063	1,807,218	3,686,051
1900	726,984	511,518	142,784	250,436	1,714,219	3,345,941
1901	839,191	558,135	129,857	230,615	1,662,815	3,420,613
1902	805,067	572,676	131,755	207,972	1,557,140	3,274,610
1903	690,161	595,047	130,406	241,564	1,956,207	3,615,385
1904	738,793	427,969	129,665	200,472	1,641,648	3,138,547
1905	851,698	436,979	132,438	172,665	1,633,716	3,226,896
1906	854,610	648,715	170,584	202,285	1,664,713	3,540,907
1907	747,736	606,159	96,916	169,258	1,787,845	3,407,914
1908	565,443	449,846	106,371	166,061	1,764,156	3,051,877
1909	647,739	447,217	163,871	194,273	1,663,436	3,116,536
1910	654,094	492,536	145,419	215,446	1,565,917	3,073,412

Total tons of each class of articles which came to the Hudson river from the Erie and Champlain canals, from 1837 to 1910, both inclusive.

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total tons.
1837	385,017	151,469	10,124	394	64,777	611,781
1838	400,877	182,142	8,478	298	48,677	640,481
1839	377,720	163,785	8,565	499	51,559	602,128
1840	321,709	302,356	8,665	104	16,178	669,012
1841	449,095	272,240	17,891	155	36,953	774,334
1842	321,480	293,177	16,015	185	35,769	666,626
1843	416,173	346,140	29,493	201	44,854	836,861
1844	545,202	383,363	39,957	246	62,627	1,031,395
1845	607,930	447,627	49,812	253	99,321	1,204,943
1846	603,010	628,454	46,076	1,797	82,982	1,362,319
1847	666,113	897,717	51,532	4,831	124,090	1,744,283
1848	603,272	685,896	44,867	6,343	107,527	1,447,905
1849	665,547	769,600	44,288	5,873	94,638	1,579,949
1850	947,768	926,048	39,669	7,105	113,273	2,033,863
1851	913,268	891,420	52,302	4,580	115,581	1,977,151
1852	1,064,677	989,268	47,512	10,605	122,760	2,234,822
1853	1,340,261	932,189	52,817	12,633	167,897	2,505,797
1854	1,103,018	846,447	40,082	14,632	219,564	2,223,743
1855	877,805	782,604	44,844	15,559	174,781	1,895,593
1856	858,771	1,023,417	50,454	14,073	176,754	2,123,469
1857	798,986	561,894	55,611	16,987	183,709	1,617,187
1858	817,613	929,789	74,981	15,233	147,526	1,985,142

Total tons of each class of articles which came to the Hudson river from Erie and Champlain canals, etc.— (Concluded).

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total tons.
1859	1,123,607	610,317	63,079	15,804	308,865	2,121,672
1860	1,137,873	1,373,393	66,696	11,235	265,407	2,824,877
1861	690,586	1,934,247	43,074	8,405	303,832	2,980,144
1862	968,062	2,152,159	45,502	5,470	231,516	3,402,709
1863	1,049,559	1,898,253	56,268	5,123	265,524	3,274,727
1864	1,106,148	1,320,562	79,480	3,469	295,598	2,805,257
1865	1,051,616	1,379,831	58,211	4,302	236,721	2,730,181
1866	1,329,884	1,542,035	60,180	6,372	367,136	3,305,607
1867	1,359,287	1,143,712	77,250	5,196	444,250	2,029,695
1868	1,459,353	1,229,554	89,814	5,058	453,370	3,237,149
1869	1,453,419	1,087,105	84,623	4,122	465,873	3,096,142
1870	1,465,517	1,049,586	91,166	12,118	587,915	3,156,302
1871	1,347,979	1,571,754	94,911	7,603	473,554	3,495,801
1872	1,467,865	1,490,248	80,936	7,672	601,223	3,647,994
1873	1,308,471	1,421,469	46,421	12,091	588,197	3,376,649
1874	1,192,681	1,470,872	49,426	12,905	497,228	3,223,112
1875	813,275	1,175,495	70,209	8,341	541,457	2,608,777
1876	890,725	906,483	44,268	4,364	580,342	2,426,182
1877	978,366	1,362,700	53,545	5,341	586,860	2,986,812
1878	1,120,666	1,833,266	56,108	7,367	619,694	3,637,101
1879	1,043,970	1,710,539	46,928	15,299	469,440	3,286,176
1880	1,202,207	2,090,283	39,397	30,264	705,251	4,067,402
1881	1,367,938	1,165,347	53,013	15,466	464,085	3,068,359

1882	1,397,816	1,024,318	61,876	24,154	559,988	3,068,152
1883	1,403,174	1,234,463	47,910	27,798	449,152	3,162,497
1884	1,097,450	1,054,041	56,899	45,538	377,259	2,631,190
1885	1,284,213	949,870	61,912	48,185	371,039	2,715,219
1886	1,202,190	1,400,301	50,704	65,988	495,708	3,215,177
1887	1,206,279	1,412,166	52,566	21,710	466,202	3,158,923
1888	1,074,279	972,746	73,027	20,364	444,245	2,584,661
1889	1,065,747	976,660	75,250	16,428	489,751	2,623,836
1890	1,086,408	901,407	65,098	524,179	447,673	3,024,765
1891	817,228	980,612	51,524	53,924	383,549	2,286,855
1892	997,436	865,958	71,380	53,946	347,799	2,366,519
1893	784,052	1,348,103	37,972	46,526	313,192	2,565,845
1894	676,155	1,189,935	58,646	103,430	228,729	2,256,895
1895	649,605	442,595	96,356	40,306	374,883	1,603,745
1896	603,545	963,253	84,605	35,107	386,868	2,073,378
1897	634,618	633,753	108,871	32,830	486,146	1,878,218
1898	527,830	552,054	94,465	27,239	342,985	1,544,573
1899	584,668	465,266	114,659	17,771	482,853	1,665,217
1900	444,719	369,984	112,960	15,193	397,775	1,340,631
1901	382,822	429,356	75,803	11,257	355,165	1,254,403
1902	336,242	407,281	88,804	9,701	361,056	1,203,084
1903	296,425	417,418	111,132	7,617	325,947	1,158,539
1904	253,525	292,756	119,837	4,250	268,323	938,691
1905	328,517	302,173	116,057	6,446	317,150	1,070,343
1906	320,177	374,422	108,880	6,553	261,040	1,071,072
1907	232,625	329,707	65,680	5,357	236,252	869,621
1908	155,507	255,925	80,984	4,880	358,624	855,920
1909	197,667	269,031	113,850	10,500	202,959	794,007
1910	200,807	301,646	103,448	9,216	146,143	761,260

The tonnage of the canals for the season of 1910 was composed of the following described class of articles:

	Tons.
Product of the forest	654,094
Agriculture	492,536
Manufactures	145,419
Merchandise	215,446
Other articles	1,565,917
Total tons	3,073,412

Of this amount:

	Tons.
Erie canal carried	2,023,185
Champlain canal carried	684,027
Black river canal carried	175,996
Cayuga and Seneca canal carried	80,125
Oswego canal carried	110,079
Total tons	3,073,412

EXPORTS *of flour, wheat and corn from New York, Baltimore, Philadelphia, Boston, New Orleans and Montreal and the percentage of the exports from each port.*

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	PERCENTAGE OF TOTAL EXPORTS AT PLACES NAMED.		
				Flour.	Wheat.	Corn.
	1880.	1880.	1880.			
New York	4,215,415	61,909,929	49,875,430	56.2	49.3	43.9
Boston	1,105,473	3,513,817	11,454,256	14.7	02.8	10.0
Philadelphia	288,656	12,342,492	18,172,396	03.8	09.9	16.0
Baltimore	525,985	33,678,376	15,244,895	07.0	26.8	13.4
Montreal	729,007	9,084,266	7,622,161	09.9	07.1	06.8
New Orleans	626,418	5,169,497	11,177,045	08.4	04.1	09.9
Total	7,500,950	125,698,377	113,546,183			
During the year 1880 the canals carried through freight going east	17,166	29,285,366	39,154,785	00.2	23.2	34.4
	1881.	1881.	1881.			
New York	4,507,052	41,788,708	31,614,480	59.9	48.2	42.7
Boston	1,109,583	3,081,232	8,038,627	14.8	03.6	10.8
Philadelphia	190,842	8,860,522	6,799,457	02.5	10.2	09.2
Baltimore	437,701	19,682,935	12,650,303	05.8	22.7	17.2

Exports of flour, wheat and corn from New York, etc.— (Continued).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	Percentage of Total Exports at Places Named.		
				Flour.	Wheat.	Corn.
	1881.	1881.	1881.			
Montreal	632,821	6,554,622	3,359,084	08.4	07.6	04.5
New Orleans	642,460	6,707,982	11,508,685	08.6	07.7	15.6
Total	7,520,459	86,676,001	73,970,636			
During the year 1881 the canals carried through freight going east	....	12,146,166	15,156,571	.....	14.0	20.3
	1882.	1882.	1882.			
New York	4,619,499	37,020,103	9,012,373	55.5	50.8	50.7
Boston	1,468,146	2,843,058	2,100,503	17.6	04.0	11.8
Philadelphia	246,147	5,759,947	839,024	02.9	07.9	04.8
Baltimore	490,734	17,465,976	1,126,055	05.9	23.8	06.4
Montreal	775,862	6,913,290	672,850	09.3	09.5	03.7
New Orleans	729,749	2,890,698	4,024,325	08.8	04.0	22.6
Total	8,330,137	72,893,072	17,775,130			
During the year 1882 the canals carried through freight going east	....	18,901,666	7,270,607	.....	25.9	40.9

	1883.	1883.	1883.			
New York	4,330,146	20,049,200	22,222,754	56.3	43.6	44.5
Boston	1,766,172	694,384	4,634,509	22.9	01.5	09.3
Philadelphia	362,877	4,372,777	5,435,642	04.7	09.5	10.9
Baltimore	441,477	15,245,868	10,012,247	05.7	33.1	20.1
Montreal	776,242	5,008,167	4,530,731	10.1	10.1	09.1
New Orleans	22,061	651,430	3,061,224	00.3	01.4	06.1
Total	7,698,975	46,021,826	49,897,107			
During the year 1883 the canals carried through freight going east	....	16,466,633	16,799,321	.....	35.7	33.6
	1884.	1884.	1884.			
New York	3,907,021	28,687,362	11,862,158	51.6	49.4	38.5
Boston	2,173,842	1,692,081	4,247,071	28.7	02.9	13.8
Philadelphia	203,460	5,775,658	1,610,392	02.6	09.9	05.2
Baltimore	444,249	16,524,524	5,651,605	05.9	28.4	18.3
Montreal	844,019	3,967,457	3,316,053	11.2	06.9	10.8
New Orleans	Not reported	1,405,219	4,089,507	.....	02.5	13.4
Total	7,572,591	58,052,301	30,776,786			
During the year 1884 the canals carried through freight going east	213	24,322,200	5,638,357	.....	.....	.....

Exports of flour, wheat and corn from New York, etc.— (Continued).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	PERCENTAGE OF TOTAL EXPORTS AT PLACES NAMED.		
				Flour.	Wheat.	Corn.
	1885.	1885.	1885.			
New York	3,763,029	16,286,800	26,259,528	45.7	54.9	43.8
Boston	1,972,326	1,062,293	3,647,244	23.9	03.5	06.1
Philadelphia	695,287	3,369,915	6,028,564	08.4	11.1	10.1
Baltimore	1,093,098	4,575,262	13,752,196	13.3	15.1	22.9
New Orleans	25,158	96,930	7,825,641	00.3	00.3	13.1
Montreal	679,426	4,221,283	2,378,827	08.4	15.4	04.0
Total	8,228,319	29,612,483	59,891,800	100.0	100.0	100.0
During the season of 1885 the canals carried through freight going east	296	16,379,100	10,883,500	.....	55.3	.....
	1890.	1890.	1890.			
New York	3,417,399	12,549,946	24,550,165	.....	.....	.....
Boston	1,289,197	497,889	4,590,085	.....	.....	.....
Philadelphia	844,480	699,274	16,844,797	.....	.....	.....
Baltimore	2,624,282	4,817,614	18,854,951	.....	.....	.....
Montreal	824,952	2,243,666	4,970,236	.....	.....	.....
Total	9,000,210	20,808,389	69,730,234			

	1891.	1891.	1891.			
New York	3,978,076	46,514,096	12,918,911	.....	.....	.....
Boston	1,560,673	2,196,782	3,946,411	.....	.....	.....
Philadelphia	1,156,342	6,876,608	2,782,678	.....	.....	.....
Baltimore	2,703,715	16,073,292	4,096,234	.....	.....	.....
Montreal	795,452	6,230,224	2,252,662	.....	.....	.....
New Orleans	52,015	10,336,496	1,912,173	.....	.....	.....
Total	10,246,273	88,227,498	27,810,069			
	1892.	1892.	1892.			
New York	6,034,260	45,259,966	18,293,353	.....	.....	.....
Boston	2,090,720	6,375,123	2,811,277	.....	.....	.....
Philadelphia	1,843,647	9,994,024	19,454,590	.....	.....	.....
Baltimore	3,661,643	16,661,559	18,995,907	.....	.....	.....
Montreal	601,243	8,379,562	1,763,854	.....	.....	.....
New Orleans	227,432	14,207,443	7,380,678	.....	.....	.....
Total	14,458,925	100,877,677	68,699,659			
	1893.	1893.	1893.			
New York	6,032,903	38,047,932	12,802,039	.....	.....	.....
Boston	1,855,471	3,934,125	5,505,966	.....	.....	.....
Philadelphia	1,376,434	5,657,398	3,985,406	.....	.....	.....
Baltimore	3,331,374	13,048,702	7,486,403	.....	.....	.....
Montreal, to November 1, only	414,522	6,504,176	9,047,524	.....	.....	.....
Total	13,010,704	67,192,333	38,827,338			

Exports of flour, wheat and corn from New York, etc.— (Continued).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	PERCENTAGE OF TOTAL EXPORTS AT PLACES NAMED.		
				Flour.	Wheat.	Corn.
	1894.	1894.	1894.			
New York	5,814,657	21,612,790	10,329,787	.....	.....	.....
Boston	1,887,272	3,519,250	3,808,243	.....	.....	.....
Philadelphia	1,106,656	3,792,700	2,408,546	.....	.....	.....
Baltimore	2,725,321	7,875,548	7,064,799	.....	.....	.....
Montreal	654,192	5,502,128	2,104,912	.....	.....	.....
Total	12,188,098	42,302,416	25,716,287			
	1895.	1895.	1895.			
New York	4,009,157	18,348,193	17,891,140	.....	.....	.....
Boston	1,144,006	4,224,773	5,117,436	.....	.....	.....
Philadelphia	848,220	1,521,226	2,624,404	.....	.....	.....
Baltimore	2,315,196	3,880,536	7,252,590	.....	.....	.....
Montreal	1,341,752	3,827,201	2,462,306	.....	.....	.....
Total	9,958,331	31,801,929	35,347,876			
	1896.	1896.	1896.			
New York	4,817,439	18,476,263	19,160,190	.....	.....	.....
Boston	1,457,526	9,838,955	5,893,209	.....	.....	.....

Philadelphia	654,128	4,863,886	829,376	.....	.....	.....
Baltimore	3,065,845	6,589,856	26,382,182	.....	.....	.....
Montreal	772,126	7,027,058	6,778,896	.....	.....	.....
Total	10,767,064	46,796,018	58,893,853			
	1897.	1897.	1897.			
New York	4,699,767	25,085,896	33,206,509	.....	.....	.....
Boston	1,208,731	9,592,108	9,424,644	.....	.....	.....
Philadelphia	815,181	4,801,606	25,140,487	.....	.....	.....
Baltimore	2,325,803	15,304,039	43,048,008	.....	.....	.....
Montreal	585,813	9,899,308	9,210,222	.....	.....	.....
Total	9,635,295	64,682,957	120,029,870			
	1898.	1898.	1898.			
New York	4,738,214	49,909,158	39,632,273	.....	.....	.....
Boston	1,579,687	12,288,159	11,542,828	.....	.....	.....
Philadelphia	1,614,423	5,660,284	29,851,346	.....	.....	.....
Baltimore	2,813,166	18,542,034	45,096,477	.....	.....	.....
Montreal	857,558	8,989,669	19,214,299	.....	.....	.....
Total	11,603,051	95,389,295	145,337,223			
	1899.	1899.	1899.			
New York	4,741,035	26,830,386	40,429,477	.....	.....	.....
Boston	1,528,257	11,567,847	17,337,608	.....	.....	.....
Philadelphia	2,101,435	4,013,927	29,458,334	.....	.....	.....

Exports of flour, wheat and corn from New York, etc.— (Continued).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	Percentage of Total Exports at Places Named.		
				Flour.	Wheat.	Corn.
	1899.	1899.	1899.			
Baltimore	3,367,485	9,549,270	46,786,127	.....	.....	.....
Montreal	....	....	....	.....	.....	.....
Total	11,738,212	51,961,430	134,011,546			
	1900.	1900.	1900.			
New York	4,487,306	18,259,428	43,532,024	37.24	31.70	26.22
Boston	1,606,175	11,028,357	14,072,326	13.33	19.15	8.47
Philadelphia	2,174,567	5,310,213	33,345,171	18.05	9.22	20.08
Baltimore	3,003,787	4,529,811	40,535,023	24.93	7.87	24.41
New Orleans	374,026	8,059,677	23,403,453	3.10	13.99	14.09
Montreal	403,385	10,408,501	11,168,489	3.35	18.07	6.73
Total	12,049,246	57,595,987	166,056,486	100	100	100
	1901.	1901.	1901.			
New York	4,092,711	27,140,388	23,831,380	33.10	23.76	26.03
Boston	1,496,163	17,910,887	10,331,712	12.10	15.67	11.28
Philadelphia	2,237,527	11,230,755	15,793,304	18.10	9.85	17.25
Baltimore	3,324,953	19,962,737	24,711,790	26.90	17.47	26.99
New Orleans	688,222	24,410,979	12,832,139	5.56	21.35	14.02
Montreal	524,494	13,594,686	4,059,790	4.24	11.90	4.43
Total	12,364,070	114,250,432	91,560,115	100	100	100

	1902.	1902.	1902.			
New York	4,149,129	19,955,526	3,052,715	34.47	25.17	22.66
Boston	901,325	8,454,795	804,038	7.50	10.66	5.97
Philadelphia	2,521,791	8,816,457	2,423,437	20.95	11.12	17.98
Baltimore	3,074,335	9,470,012	4,501,555	25.54	11.94	33.40
Montreal	777,810	16,951,132	237,328	6.46	21.38	1.77
New Orleans	612,290	15,643,745	2,454,128	5.08	19.73	18.22
Total	12,036,680	79,291,667	13,473 201	100	100	100
	1903.	1903.	1903.			
New York	4,281,084	9,435,934	22,068,881	31.43	21	28.31
Boston	767,044	2,867,994	6,627,107	5.63	6.38	8.50
Philadelphia	2,664,177	1,600,790	9,994,838	19.56	3.57	12.82
Baltimore	3,489,618	3,160,614	19,113,566	25.62	7.04	24.52
Montreal	1,045,631	15,871,969	6,811,590	7.67	35.33	8.75
New Orleans	1,374,344	11,989,273	13,332,213	10.09	26.68	17.10
Total	13,621,898	44,926,574	77,943,185	100	100	100
	1904.	1904.	1904.			
New York	2,672,766	425,874	9,433,283	36.69	4.20	25.53
Boston	610,103	156,164	3,693,404	8.38	1.54	10.00
Philadelphia	1,256,151	8,000	6,169,968	17.24	0.08	16.69
Baltimore	1,281,266	140,262	7,706,237	17.59	1.39	20.84
Montreal	840,005	7,507,266	3,721,583	11.53	74.12	10.07
New Orleans	624,337	1,891,064	6,233,417	8.57	18.67	16.87
Total	7,284,628	10,128,630	36,957,892	100	100	100

Exports of flour, wheat and corn from New York, etc.—(Continued).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	PERCENTAGE OF TOTAL EXPORTS AT PLACES NAMED.		
				Flour.	Wheat.	Corn.
	1905.	1905.	1905.			
New York	2,550,938	3,666,201	27,283,344	38.43	22.63	31.20
Boston	491,418	119,677	10,714,804	7.40	0.76	12.25
Philadelphia	1,264,227	640,448	7,647,880	19.04	3.95	8.75
Baltimore	1,226,033	1,304,456	15,415,604	18.47	8.05	17.63
Montreal	538,307	9,916,687	5,883,842	8.11	61.22	6.73
New Orleans	567,398	549,356	20,498,474	8.55	3.39	23.44
Total	6,638,321	16,196,825	87,443,948	100	100	100
	1906.	1906.	1906.			
New York	3,038,838	14,913,686	20,779,730	33.64	32.67	25.74
Boston	735,319	1,983,993	4,174,402	8.13	4.34	5.18
Philadelphia	2,011,441	4,749,586	9,408,537	22.27	10.40	11.66
Baltimore	1,547,891	4,138,389	24,611,513	17.13	9.06	30.49
New Orleans	996,825	5,583,993	17,294,135	11.04	12.23	21.43
Montreal	703,211	14,289,551	4,438,283	7.79	31.30	5.50
Total	9,033,525	45,659,198	80,706,600	100	100	100
	1907.	1907.	1907.			
New York	3,045,125	22,769,338	21,253,050	32.09	31.39	32.72
Boston	862,004	4,360,382	5,303,997	9.09	6.02	8.17
Philadelphia	2,421,406	11,295,013	6,855,029	25.52	15.58	10.55

Baltimore	1,823,407	8,057,570	19,829,427	19.21	11.11	30.52
Montreal	861,936	20,949,496	4,830,251	9.08	28.88	7.44
New Orleans	475,655	5,089,669	6,884,482	5.01	7.02	10.60
Total	9,489,533	72,521,468	64,956,236	100	100	100
	1908.	1908.	1908.			
New York	3,410,944	20,578,026	4,686,576	37.35	27.46	20.56
Boston	726,632	2,533,460	1,022,338	7.95	3.40	4.46
Philadelphia	2,299,149	11,731,982	1,626,381	25.18	15.66	7.15
Baltimore	1,347,098	9,168,368	10,606,954	14.75	12.24	46.53
Montreal	746,073	27,405,034	268,433	8.17	36.59	1.18
New Orleans	602,838	3,477,388	4,586,461	6.60	4.65	20.12
Total	9,132,734	74,894,258	22,797,143	100	100	100
	1909.	1909.	1909.			
New York	2,991,063	12,587,537	4,149,506	36.38	25.97	18.00
Boston	461,332	870,339	2,029,923	5.61	1.80	8.80
Philadelphia	1,708,721	5,245,290	3,473,940	20.80	10.82	15.05
Baltimore	906,169	2,991,527	6,772,959	11.02	6.18	29.35
Montreal	1,602,904	25,004,491	424,183	19.49	51.58	1.85
New Orleans	550,858	1,773,641	6,225,837	6.70	3.65	26.95
Total	8,221,047	48,472,825	23,076,348	100	100	100

Exports of flour, wheat and corn from New York, etc.— (Concluded).

	Flour, barrels.	Wheat, bushels.	Corn, bushels.	PERCENTAGE OF TOTAL EXPORTS AT PLACES NAMED.		
				Flour.	Wheat.	Corn.
	1910.	1910.	1910.			
New York	2,963,869	2,449,860	7,242,901	44.06	8.45	25.42
Boston	380,794	721,590	2,719,018	5.66	2.49	9.55
Philadelphia	995,687	2,758,039	804,305	14.80	9.51	2.82
Baltimore	738,974	2,768,320	7,767,084	10.99	9.53	27.26
Montreal	1,074,574	20,089,558	2,751,562	15.97	69.27	9.65
New Orleans	572,801	213,687	7,205,151	8.52	0.75	25.30
Total	6,726,699	29,001,054	28,490,021	100	100	100

STATEMENT *of lockages during the season of* 1910.

DATE.	ERIE CANAL.				
	Lock No. 1.	Lock No. 2.	Lower side cut.	Upper side cut, river lock.	Upper side cut upper lock.
May	32	23	64	532	486
June	70	59	91	929	770
July	76	52	49	1.104	838
August	39	43	43	822	742
September	59	47	41	798	750
October	61	36	30	1,141	935
November	34	34	36	622	512
Total	371	294	354	5,948	5,033

Statement of lockages during the season of 1910 — (Continued).

DATE.	ERIE CANAL.				
	Lock No. 3.	Lock No. 45.	Lock No. 46.	Lock No. 49.	Lock No. 50.
May	452	493	535	585	531
June	799	921	1,091	1,060	878
July	793	977	1,151	1,226	1,012
August	761	917	1,110	1,176	950
September	735	999	1,159	1,092	979
October	866	1,177	1,105	1,043	917
November	524	596	658	618	491
Total	4,930	6,080	6,809	6,800	5,758

Statement of lockages during the season of 1910 — (Continued).

DATE.	ERIE CANAL.				
	Lock No. 66.	Combined locks, Lockport.	Tonawanda lock.	Lock No. 72.	Junction lock
May	493	384	411	349	25
June	807	685	963	745	46
July	769	712	1,354	1,198	39
August	879	744	1,348	1,157	39
September	838	769	1,063	1,041	60
October	838	968	749	1,093	53
November	431	495	241	389	28
Total	5,055	4,757	6,129	5,972	285

Statement of lockages during the season of 1910 — (Continued).

DATE.	CHAMPLAIN CANAL.			OSWEGO CANAL.	
	Guard lock.	Fort Edward lock.	Whitehall lock.	Lock No. 1.	Lock No. 13.
May	232	274	328	151	10
June	423	557	655	415	94
July	382	778	882	471	162
August	398	769	805	485	155
September	331	615	677	361	152
October	390	624	500	185	77
November	236	451	310	84	25
Total	2,392	4,068	4,157	2,152	675

Statement of lockages during the season of 1910 — (Concluded).

DATE.	BLACK RIVER CANAL.	CAYUGA AND SENECA CANAL.			Caughdenoy lock Oneida river improvement.
	Lock No. 1.	Montezuma lock.	Waterloo lock.	Mud lock.	
May	....	94	79	101	135
June	230	242	165	226	359
July	332	336	175	291	410
August	332	339	184	252	450
September	315	246	151	209	381
October	263	193	177	211	289
November	112	66	60	65	70
Total	1,584	1,516	991	1,355	2,094

STATEMENT *of the tons of property moved on each and all the canals, comprising the tons of total movement.*

YEAR.	Erie.	Champlain.	Oswego.	Cayuga and Seneca.	Chemung.	Crooked Lake.
1837	667,151	261,659	161,353	20,274	20,288	24,258
1838	744,848	266,553	222,697	23,541	30,256	30,336
1839	845,007	263,552	221,300	26,300	36,089	26,823
1840	829,960	245,229	219,627	32,486	34,217	24,026
1841	906,442	276,418	135,689	34,634	63,042	33,030
1842	712,310	230,844	129,498	31,716	54,866	18,660
1843	819,216	262,212	240,571	25,998	66,247	31,856
1844	945,944	269,546	326,607	31,099	88,231	32,589
1845	1,038,700	266,922	340,481	46,464	114,740	39,489
1846	1,264,408	280,480	351,511	61,014	124,768	35,556
1847	1,661,575	313,124	441,096	58,204	189,165	36,318
1848	1,599,965	293,889	490,147	46,252	150,691	34,155
1849	1,622,444	321,345	557,637	40,440	135,867	36,317
1850	1,635,089	460,219	583,346	42,379	128,263	38,797
1851	1,955,265	513,793	676,321	37,084	159,563	29,399
1852	2,159,334	531,001	684,191	47,275	187,577	35,757
1853	2,198,308	608,354	761,276	58,793	249,980	53,985
1854	2,224,008	602,913	611,533	72,995	270,978	25,349
1855	2,202,463	537,108	654,399	76,744	223,271	25,850
1856	2,107,678	611,610	657,381	131,907	245,621	28,559
1857	1,566,624	547,236	605,218	120,435	187,201	16,571
1858	1,767,004	608,918	688,960	75,968	205,168	16,318
1859	1,753,954	751,046	612,390	80,602	256,323	17,933

Statement of the tons of property moved on each and all the canals, etc.— (Continued).

YEAR.	Erie.	Champlain.	Oswego.	Cayuga and Seneca.	Chemung.	Crooked Lake.
1860	2,253,533	681,157	1,080,076	98,678	226,051	14,723
1861	2,500,782	545,930	852,920	100,992	208,792	12,329
1862	3,204,277	647,318	1,063,413	125,659	243,628	19,632
1863	2,955,302	878,920	992,173	119,704	307,151	11,230
1864	2,535,792	846,790	765,079	185,161	280,834	6,316
1865	2,523,490	815,311	825,649	192,312	164,796	9,376
1866	2,896,027	1,001,493	990,809	368,223	226,510	12,189
1867	2,920,578	1,047,440	940,136	389,704	145,627	6,558
1868	3,346,986	1,120,585	958,444	515,295	165,875	4,451
1869	2,845,072	1,059,339	934,638	533,516	245,761	7,541
1870	3,083,132	1,143,719	917,728	527,728	206,535	15,825
1871	3,580,922	1,099,995	941,858	445,186	173,281	12,024
1872	3,562,560	1,449,528	832,490	386,977	217,263	7,145
1873	3,602,535	1,195,390	655,588	437,382	257,962	12,831
1874	3,097,122	1,268,292	665,408	378,825	205,602	9,286
1875	2,787,226	1,077,746	486,530	224,492	129,425	....
1876	2,418,422	910,151	370,330	137,264	214,448	....
1877	3,254,367	1,021,782	319,327	247,864	12,026	....
1878	3,608,634	1,040,912	257,254	168,201	8,767	....
1879	3,820,027	1,012,005	333,713	117,027	....	....
1880	4,608,651	1,200,503	427,863	125,331	....	....
1881	3,598,721	986,079	394,542	99,617	....	....
1882	3,694,364	1,097,343	445,295	123,448	....	....

1883	3,587,102	1,366,358	276,350	134,631		
1884	3,389,555	1,118,073	260,541	119,990		
1885	3,208,207	1,139,402	213,079	64,125		
1886	3,808,642	1,119,663	186,484	64,995		
1887	3,840,513	1,229,335	176,177	195,933		
1888	3,321,516	1,198,305	134,078	201,237		
1889	3,673,554	1,187,038	170,078	196,138		
1890	3,303,929	1,520,757	225,936	63,419		
1891	3,097,853	1,101,126	161,426	80,954		
1892	2,978,832	1,021,139	90,886	75,669		
1893	3,235,726	848,965	92,634	38,761		
1894	3,144,144	550,279	98,843	33,270		
1895	2,356,084	966,335	64,154	49,050		
1896	2,742,438	802,519	57,245	54,739		
1897	2,584,906	797,637	53,537	110,277		
1898	2,338,020	804,076	47,662	100,342		
1899	2,419,084	1,034,315	49,373	113,476		
1900	2,145,876	972,867	31,742	130,126		
1901	2,257,035	885,641	43,210	166,258		
1902	2,105,876	766,615	143,707	155,152		
1903	2,414,018	801,649	184,434	116,918		
1904	1,945,708	796,468	170,342	140,656		
1905	1,999,824	833,550	178,777	123,927		
1906	2,385,491	740,983	172,228	164,874		
1907	2,415,548	678,506	143,277	112,570		
1908	2,177,443	614,762	92,831	81,029		
1909	2,031,307	732,125	121,717	84,957		
1910	2,023,185	684,027	110,079	80,125		

Statement of the tons of property moved on each and all the canals, etc.— (Continued).

YEAR.	Chenango.	Genesee Valley.	Black River.	Oneida Lake.	Baldwinsville.	Total.
1837	8,213					1,171,296
1838	14,778					1,333,011
1839	16,928					1,435,713
1840	16,848	13,653				1,416,046
1841	23,356	26,892		22,150		1,521,681
1842	17,177	41,860				1,236,931
1843	19,026	48,313		26,445		1,513,439
1844	31,472	65,077		25,991		1,816,586
1845	38,305	73,546		28,808		1,977,565
1846	41,112	87,614		22,188		2,268,662
1847	44,051	95,632		30,642		2,849,810
1848	35,207	98,467		47,451		2,796,230
1849	36,557	84,674		59,451		2,794,732
1850	41,892	89,804		56,828		3,076,617
1851	40,307	100,000	25,320	45,049		3,582,733
1852	44,939	122,901	36,597	43,969		3,863,441
1853	76,538	157,164	41,924	43,351		4,247,853
1854	77,124	158,942	55,525	34,532	31,945	4,165,862
1855	89,390	102,321	51,347	27,116	32,608	4,022,617
1856	105,502	113,731	68,126	18,485	27,481	4,116,082
1857	96,722	114,576	69,135	19,343		3,344,061
1858	72,526	118,303	62,353	19,675		3,665,192

1859	89,691	124,263	75,946	19,536		3,981,648
1860	83,635	123,602	70,687	18,672		4,650,214
1861	91,661	94,329	69,930	30,060		4,707,635
1862	79,442	129,974	85,442			5,598,785
1863	90,215	112,549	90,448			5,557,692
1864	89,021	71,411	72,519			4,852,941
1865	68,822	56,581	73,317			4,729,654
1866	107,472	86,579	85,908			5,775,220
1867	103,064	64,679	70,539			5,688,325
1868	112,455	138,364	79,770			6,442,225
1869	83,527	69,141	80,550			5,859,080
1870	102,820	79,733	96,329			6,173,769
1871	39,793	85,269	89,560			6,467,888
1872	26,519	96,113	94,776			6,673,370
1873	30,317	86,770	86,017			6,364,782
1874	33,059	69,393	77,601			5,804,588
1875	23,769	64,677	65,993			4,859,858
1876	6,227	47,360	67,927			4,172,129
1877		37,311	63,286			4,955,963
1878		18,569	68,983			5,171,320
1879			79,600			5,362,372
1880			75,308			6,457,656
1881			100,233			5,179,192
1882			106,933			5,467,423
1883			128,656			5,664,056
1884			116,359			5,009,488
1885			106,971			4,731,784
1886			114,198			5,293,982
1887			111,847			5,553,805

Statement of the tons of property moved on each and all of the canals, etc.— (Concluded).

YEAR.	Chenango.	Genesee Valley.	Black River.	Oneida Lake.	Baldwinsville.	Total.
1888	....	....	118,213	....	....	4,942,948
1889	....	....	143,561	....	....	5,370,369
1890	....	....	132,061	....	....	5,246,102
1891	....	....	122,111	....	....	4,563,472
1892	....	....	115,469	....	....	4,231,995
1893	....	....	115,877	....	....	4,331,963
1894	....	....	56,024	....	....	3,882,560
1895	....	....	64,691	....	....	3,500,314
1896	....	....	57,953	....	....	3,714,894
1897	....	....	71,447	....	....	3,617,894
1898	....	....	69,963	....	....	3,360,083
1899	....	....	69,803	....	....	3,686,051
1900	....	....	65,330	....	....	3,345,941
1901	....	....	68,469	....	....	3,420,613
1902	....	....	103,260	....	....	3,274,610
1903	....	....	98,366	....	....	3,615,385
1904	....	....	85,373	....	....	3,138,547
1905	....	....	90,818	....	....	3,226,896
1906	....	....	77,331	....	....	3,540,907
1907	....	....	58,013	....	....	3,407,914
1908	....	....	85,812	....	....	3,051,877
1909	....	....	146,430	....	....	3,116,536
1910			175,996			3,073,412

Total value of articles moved on all the canals from 1837 to 1910, both years inclusive.

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total.
1837	$6,146,716	$16,201,331	$6,390,486	$23,935,990	$3,134,766	$55,806,288
1838	6,338,063	19,390,714	5,915,856	31,594,692	2,507,234	65,764,559
1839	7,762,553	17,056,911	5,989,576	39,493,764	3,096,960	73,399,764
1840 (G. Val. canal opened)	4,609,035	19,644,481	4,719,054	35,636,943	2,694,379	66,303,892
1841	11,841,103	21,901,713	5,422,615	50,134,320	2,993,178	92,202,929
1842	5,957,219	16,987,843	4,435,289	30,042,153	2,594,104	60,016,608
1843	6,653,080	20,588,118	4,925,545	40,651,798	3,458,386	76,276,909
1844	7,422,737	23,379,643	6,151,806	49,224,099	4,472,867	90,021,152
1845	6,472,237	25,479,488	6,994,932	52,542,336	5,140,866	100,629,859
1846	6,422,409	35,820,586	7,015,311	62,004,488	4,349,315	115,612,100
1847	7,546,063	55,757,166	8,072,059	74,753,638	5,434,502	151,563,428
1848	7,219,350	42,850,086	7,433,957	76,945,463	5,637,301	140,086,157
1849	8,671,057	46,408,092	7,183,930	77,094,282	5,374,924	144,732,285
1850	15,117,661	46,152,958	7,933,108	81,135,199	6,059,003	156,397,929
1851	12,549,754	43,277,458	8,255,575	88,531,320	7,367,694	159,981,801
1852	11,526,636	49,437,555	6,294,120	122,624,170	6,721,236	196,603,517
1853	14,001,506	57,482,815	8,091,100	118,317,856	9,286,293	207,179,570
1854	14,384,785	51,980,864	9,796,420	123,367,863	10,954,380	210,284,312
1855	10,545,615	58,222,314	10,467,559	113,572,523	11,582,136	204,390,147
1856	10,211,383	51,030,453	10,308,419	135,691,816	11,084,991	218,327,062
1857	9,827,410	30,955,369	9,330,067	74,633,905	12,250,267	136,997,018
1858	8,983,443	50,142,318	9,352,955	61,236,319	8,873,809	138,568,841
1859	10,798,769	34,044,601	8,757,059	65,072,972	13,487,357	132,160,758

Total value of articles moved on all the canals from 1837 to 1910, etc.—(Concluded).

YEAR.	Product of the forest.	Agriculture.	Manufactures.	Merchandise.	Other articles.	Total.
1860	$10,654,710	$55,838,977	$8,113,177	$84,252,425	$11,989,909	$170,849,198
1861	6,462,614	37,861,720	6,718,273	49,707,729	9,365,557	130,115,893
1862	11,305,951	84,239,870	12,314,651	83,640,903	11,733,453	203,234,331
1863	13,121,909	101,090,511	13,044,051	91,417,513	21,072,477	240,046,461
1864	22,589,060	116,051,564	22,582,718	80,391,550	32,785,747	274,400,639
1865	21,011,122	83,670,467	18,095,266	102,627,877	30,832,372	256,237,104
1866	28,754,821	86,610,934	18,389,992	100,169,211	37,038,718	270,963,676
1867	28,907,470	81,616,663	16,877,334	108,545,569	42,939,676	278,956,712
1868	24,089,591	76,383,656	17,298,574	131,786,764	55,793,344	305,301,920
1869	21,960,655	55,528,825	13,595,892	103,464,505	54,761,407	249,281,284
1870	22,266,184	40,231,912	10,777,897	94,852,911	54,707,269	231,836,176
1871	27,309,303	68,130,282	10,881,540	78,898,185	53,548,381	238,767,691
1872	35,599,734	49,541,259	7,659,547	93,997,415	34,115,366	220,913,321
1873	18,651,838	60,194,969	5,979,656	76,173,336	30,715,761	191,715,500
1874	17,840,356	64,344,898	7,094,531	64,477,540	42,916,997	196,674,322
1875	12,478,669	50,540,911	6,311,137	40,885,448	34,792,410	145,008,575
1876	11,132,966	32,439,857	3,375,119	31,069,375	35,073,062	113,090,379
1877	15,574,893	46,765,635	10,911,786	46,130,795	21,028,903	139,411,963
1878	12,703,074	52,264,813	17,834,755	70,433,563	29,021,323	182,254,528
1879	12,053,499	56,826,653	37,173,222	144,653,500	34,573,762	285,280,726
1880	14,351,622	68,994,219	14,236,227	109,870,264	40,392,459	247,844,790
1881	18,399,932	43,440,343	11,863,021	75,331,308	13,148,961	162,153,565
1882	20,285,512	42,766,687	4,673,440	61,769,417	18,428,851	147,918,907
1883	18,038,056	39,727,973	3,426,474	68,281,320	18,387,400	147,861,223

1884	27,588,279	37,335,779	3,125,433	78,864,806	15,182,754	162,007,069
1885	17,302,705	31,404,325	2,827,280	58,215,252	9,786,627	119,536,389
1886	16,471,406	41,191,562	3,310,422	103,749,354	15,339,102	190,061,846
1887	15,568,667	42,729,624	4,808,178	82,161,364	13,978,084	159,245,977
1888	14,899,643	33,546,141	3,207,881	56,913,813	13,957,257	122,524,735
1889	17,012,190	30,014,906	5,908,500	80,590,288	21,058,338	154,584,222
1890	21,888,280	32,680,782	1,879,276	73,838,260	15,464,488	145,617,086
1891	17,923,469	38,566,171	1,147,639	47,008,705	11,623,269	116,269,343
1892	18,571,008	35,127,543	1,491,611	100,701,774	11,705,012	167,596,948
1893	14,421,877	50,483,054	853,407	75,474,765	13,597,991	154,831,094
1894	12,706,519	35,849,109	933,886	78,405,074	13,284,972	141,179,560
1895	14,504,441	17,185,539	2,489,514	38,648,131	24,625,396	97,453,021
1896	11,838,186	27,268,642	2,494,727	37,512,064	20,925,959	100,039,578
1897	11,780,232	16,722,091	1,932,216	42,299,589	23,329,210	96,063,338
1898	11,489,502	15,005,458	1,369,262	36,386,337	23,781,795	88,122,354
1899	14,312,288	13,428,551	1,555,810	40,752,834	22,737,229	92,786,712
1900	9,161,366	11,051,632	2,073,468	42,819,110	19,018,196	84,123,772
1901	10,697,001	15,036,822	1,773,198	37,467,681	18,504,178	83,478,880
1902	9,546,375	15,546,609	1,687,462	34,857,640	20,070,367	81,708,453
1903	9,726,311	15,812,570	1,835,315	34,613,801	15,725,328	77,713,325
1904	9,255,116	13,791,790	1,515,628	27,205,160	14,614,123	66,381,817
1905	11,640,382	13,875,972	1,589,118	19,292,625	11,520,489	57,918,586
1906	12,639,416	17,743,782	1,903,347	23,531,901	10,682,971	66,501,417
1907	11,032,348	22,069,011	1,146,417	19,957,084	9,699,110	63,903,970
1908	7,905,428	15,641,072	1,403,612	19,415,235	10,146,162	54,511,509
1909	9,027,781	13,902,062	2,665,622	22,405,574	11,080,533	59,081,572
1910	9,373,099	15,068,375	2,161,199	25,132,370	7,307,135	59,042,178

STATEMENT *of total movement of flour, meal and grain on all the canals from* 1861 *to* 1910, *both inclusive.*

YEAR.	Barrels wheat flour.	Barrels corn meal.	Bushels wheat.	Bushels corn.	Bushels oats.
1861	1,667,416	2,176	33,171,900	25,024,643	6,105,313
1862	2,102,574	18,416	37,579,967	27,225,643	6,550,187
1863	1,930,731	44,704	26,577,166	222,087,056	16,040,937
1864	1,474,582	51,305	19,932,067	11,086,536	15,122,937
1865	1,271,129	24,018	14,433,566	20,689,500	11,973,939
1866	751,870	27,972	10,989,800	28,904,143	12,138,250
1867	569,234	12,808	13,630,300	17,930,500	10,476,000
1868	575,900	14,861	14,425,567	18,437,100	11,927,250
1869	657,807	12,666	22,351,133	9,159,643	5,769,312
1870	509,055	22,250	21,950,800	6,893,893	7,371,312
1871	381,583	6,611	23,951,633	24,002,033	8,118,187
1872	190,129	6,046	13,463,433	32,241,179	5,809,938
1873	181,731	9,342	26,768,800	22,760,571	4,376,437
1874	269,759	8,314	25,738,766	18,542,964	3,713,000
1875	163,287	3,000	24,809,766	10,072,536	3,919,813
1876	86,019	2,232	13,879,200	13,044,786	3,259,188
1877	82,621	3,120	14,934,766	25,837,786	4,127,812
1878	54,666	5,666	28,151,866	26,249,750	5,314,313
1879	66,333	8,130	31,648,866	22,185,000	1,447,750
1880	76,537	12,620	32,201,733	41,307,821	1,305,812
1881	64,129	13,370	14,827,733	16,993,679	1,895,063
1882	86,777	17,370	21,407,196	8,988,821	1,386,250
1883	83,768	1,777	19,124,666	18,677,785	3,225,438

1884	67,138	343	26,346,966	7,079,143	3,293,500
1885	63,602	703	18,864,066	12,866,500	514,625
1886	83,296	5,435	33,270,966	12,670,178	454,875
1887	37,861	65	31,228,000	15,950,607	2,210,312
1888	30,463	2,629	19,373,366	17,846,464	4,445,562
1889	40,555	1,713	16,137,900	21,162,536	3,980,000
1890	32,046	10,740	11,789,700	21,998,000	2,961,437
1891	28,900	....	25,203,366	5,076,464	1,022,625
1892	45,176	38,000	20,690,933	5,366,750	4,527,750
1893	22,574	1,222	36,446,600	8,912,965	1,498,375
1894	27,047	978	30,116,266	9,942,035	6,302,937
1895	20,333	74	3,345,500	3,495,857	5,892,437
1896	73,741	3,639	13,629,033	3,641,821	12,357,187
1897	29,685	1,481	6,001,166	11,170,572	3,146,562
1898	17,166	435	2,332,866	13,008,857	4,765,250
1899	11,546	287	9,414,066	3,309,643	5,858,312
1900	10,866	818	4,610,083	6,751,670	2,277,258
1901	6,926	331	7,165,140	3,121,192	5,533,000
1902	12,302	1,085	9,731,281	1,178,650	2,792,447
1903	9,954	602	4,794,400	6,833,964	3,895,375
1904	12,009	990	3,375,334	2,442,178	5,176,500
1905	2,130	870	3,669,500	936,536	5,902,312
1906	2,778	92	6,355,434	4,800,464	6,545,375
1907	1,657	74	8,392,567	3,200,821	4,000,062
1908	157	....	6,122,200	2,525,036	3,813,190
1909	805	....	6,395,134	2,837,821	4,972,687
1910	129	....	5,974,967	4,399,607	5,275,500

Statement of total movement of flour, meal and grain on all the canals, etc.— (Concluded).

YEAR.	Bushels barley.	Bushels rye.	Bushels peas and beans.	Bushels malt.	Aggregate in tons.
1861	2,444,083	976,000	347,233	....	2,070,251
1862	2,764,916	967,750	375,433	280,182	2,332,928
1863	3,816,458	592,571	530,700	366,242	2,021,505
1864	3,232,292	670,168	550,000	565,294	1,437,598
1865	5,336,416	1,220,714	401,533	725,151	1,530,037
1866	7,867,041	1,751,928	536,667	298,212	1,680,169
1867	4,972,250	1,044,643	827,133	489,818	1,322,774
1868	3,698,083	873,357	391,667	257,029	1,350,090
1869	4,125,500	481,750	379,233	330,400	1,221,397
1870	5,132,958	697,143	226,123	698,686	1,189,267
1871	4,749,662	1,234,392	162,700	801,371	1,759,882
1872	5,002,543	477,036	146,600	1,578,914	1,586,249
1873	2,941,083	1,077,143	393,300	1,182,466	1,660,981
1874	4,110,584	293,393	200,567	453,200	1,500,490
1875	4,353,125	296,750	195,200	71,287	1,238,115
1876	4,020,584	712,464	174,200	1,510,629	991,197
1877	5,810,542	1,283,857	162,533	718,800	1,439,665
1878	3,730,583	2,307,607	167,100	1,031,000	1,816,742
1879	4,006,000	2,114,643	124,466	582,706	1,770,846
1880	4,426,958	940,714	149,369	820,824	2,304,219
1881	3,399,458	553,000	101,334	887,526	1,074,545
1882	4,027,083	1,549,000	206,834	846,824	1,087,953

1883	2,449,291	3,401,643	43,666	952,706	1,329,099
1884	2,708,666	2,552,214	185,735	707,235	1,198,346
1885	2,691,135	364,678	70,000	604,706	1,028,260
1886	2,619,916	108,750	151,366	901,941	1,446,973
1887	3,144,083	239,892	14,133	781,588	1,498,304
1888	873,208	438,143	64,000	940,176	1,116,733
1889	2,754,541	1,289,357	694,333	1,640,588	1,277,118
1890	3,268,321	800,500	66,833	1,201,058	1,158,029
1891	2,995,958	2,456,107	87,996	662,325	1,072,375
1892	2,149,833	151,285	20,633	816,650	992,798
1893	2,207,250	232,785	42,933	309,118	1,435,540
1894	3,720,625	18,946	33,366	388,058	1,388,859
1895	3,255,458	7,322	15,766	166,000	583,754
1896	4,581,917	2,757,500	12,500	682,764	916,072
1897	4,180,708	2,370,964	10,733	1,037,941	731,213
1898	3,746,083	276,607	4,100	1,565,941	636,774
1899	3,276,125	211,821	800	473,823	562,740
1900	2,633,480	374,224	154	533,636	447,768
1901	2,311,597	368,796	1,334	471,050	465,426
1902	3,138,100	660,817	335	645,600	475,863
1903	2,993,208	429,536	1,767	731,706	495,005
1904	3,692,750	84,321	34	125,559	346,991
1905	4,035,292	132,750	567	362,648	337,815
1906	5,020,708	142,571	5,900	418,706	561,896
1907	3,837,583	76,950	267	817,706	513,754
1908	2,000,292	75,428	25,500	708,176	378,318
1909	2,103,166	217,893	23,700	698,471	420,125
1910	1,851,625	85,000	900	869,118	448,481

STATEMENT *of foreign exports of flour and grain from New York from* 1861 *to* 1910.

YEAR.	Barrels wheat flour.	Barrels rye flour.	Barrels corn meal.	Bushels wheat.	Bushels corn.	Bushels oats.
1861	3,110,646	11,807	108,385	28,889,914	12,456,265	160,875
1862	2,961,518	8,397	132,606	25,564,755	12,020,848	210,669
1863	2,527,338	5,461	140,561	15,424,889	7,533,431	125,566
1864	1,918,393	2,840	105,142	12,193,433	846,831	42,135
1865	1,402,144	2,673	127,600	2,527,626	2,549,670	94,567
1866	900,084	7,552	149,773	522,669	11,079,394	1,190,583
1867	871,089	11,754	151,669	4,468,774	8,147,813	144,665
1868	1,003,968	7,459	191,011	5,762,037	5,989,225	94,707
1869	1,584,211	5,283	137,627	18,240,586	1,637,586	49,393
1870	1,950,234	....	....	18,446,035	487,792	28,986
1871	1,660,400	4,200	123,500	21,968,600	13,040,600	47,300
1872	1,216,082	6,399	194,040	13,144,400	25,292,200	31,739
1873	1,655,331	8,249	176,756	27,801,800	15,587,500	49,700
1874	1,177,608	8,473	168,603	34,791,249	19,000,995	122,528
1875	1,954,100	5,700	173,400	26,192,700	12,938,700	138,800
1876	1,887,441	5,778	172,042	24,144,033	16,610,232	620,536
1877	1,537,106	7,799	220,939	21,355,774	25,373,942	257,634
1878	2,630,437	4,375	202,788	55,019,389	27,440,771	3,658,905
1879	3,684,366	6,049	150,178	61,538,861	35,319,789	521,406
1880	4,215,415	5,205	203,716	61,908,029	49,875,430	427,959
1881	4,440,114	3,264	196,985	41,788,182	31,731,995	431,426
1882	4,623,965	....	112,316	37,620,153	9,012,373	170,586
1883	4,330,146	....	....	20,049,200	22,222,754	162,665

1884	3,907,021	....	530	28,687,362	11,862,158	2,456,219
1885	3,763,029	3,863	152,488	16,286,800	26,259,228	6,198,302
1886, not reported	....	....	....	....	....	....
1887, to December 1	3,731,523	....	105,735	40,893,437	11,920,425	142,938
1888, to December 1	3,476,991	....	107,589	12,224,374	12,101,098	112,069
1889, to December 1	3,056,855	....	135,006	9,627,444	27,380,443	885,257
1890	3,417,399	....	136,432	12,549,946	24,550,165	9,301,046
1891	3,798,076	....	160,533	46,514,096	12,819,911	3,205,466
1892	6,034,260	....	163,765	45,259,966	18,293,353	2,650,639
1893	6,032,903	114	159,149	38,017,932	12,802,039	5,177,007
1894, to December 1	5,814,657	....	178,346	21,612,790	10,329,787	219,844
1895, to December 1	4,009,157	....	144,631	18,348,193	17,891,140	1,302,900
1896, to December 1	4,264,302	....	140,449	16,864,330	16,845,658	14,794,568
1897	4,699,767	....	272,975	25,085,896	33,206,509	34,714,008
1898	4,738,214	....	366,663	49,909,158	39,632,273	23,765,046
1899	4,741,035	....	407,691	26,830,386	40,429,477	12,943,153
1900	4,487,306	....	444,943	18,259,428	43,532,024	8,819,441
1901	4,092,711	....	317,920	27,140,388	23,831,380	8,457,228
1902	4,149,129	....	187,004	19,955,526	3,052,715	1,803,663
1903	4,281,084	....	439,174	9,435,934	22,063,881	669,423
1904	2,672,766	....	250,204	425,874	9,433,283	269,670
1905	2,550,938	....	277,154	3,666,201	27,283,344	6,489,616
1906	3,038,838	....	205,203	14,913,686	20,779,730	5,218,147
1907	3,045,125	....	197,047	22,769,338	21,253,050	280,751
1908	3,410,944	....	173,934	20,578,026	4,686,576	145,341
1909	2,991,063	....	136,187	12,587,537	4,149,506	305,355
1910	2,963,869	....	179,692	2,449,860	7,242,901	283,675

Statements of foreign exports of flour and grain, etc.— (Concluded).

YEAR.	Bushels barley.	Bushels rye.	Bushels peas and beans.	Bushels malt.	Aggregate in tons.
1861	3,927	1,000,405	139,284		1,599,261
1862	42,061	1,104,549	113,819		1,477,221
1863	52,439	416,369	110,911		980,675
1864	150	588	186,154		614,642
1865		198,348	88,899		322,451
1866	1,329,842	248,646	282,992		506,520
1867	886,893	473,260	680,763		531,204
1868	90	152,993	189,226		481,902
1869		142,542	123,156		788,075
1870		92,431	151,102		785,249
1871	98,700	525,800	90,900		1,238,053
1872	22,056	668,030	156,609		1,378,412
1873	19,400	1,069,100	143,500		1,504,771
1874	3,560	641,661	463,193		1,863,297
1875	1,500	206,900	364,900		1,405,544
1876	88,097	1,336,283	716,428		1,483,402
1877	2,412,509	2,049,796	487,031		1,675,902
1878	1,518,922	4,048,841	476,184		2,949,042
1879	147,867	3,941,638	393,153		3,383,953
1880	254,833	2,181,183	654,669		3,825,168
1881	15,477	1,068,928	218,370		2,687,356
1882	6,616	1,980,586	572,567		1,967,989
1883	8,939	4,467,853			1,819,284

1884	76,343	4,846,088	770,729	....	1,413,686
1885	408	493,319	....	....	1,759,840
1886, not reported	....	....	....	....	....
1887, to December 1	46,189	356,817	185,877	....	2,193,962
1888, to December 1	48	6,237	182,511	....	1,098,641
1889, to December 1	226	809,405	244,246	....	1,440,719
1890	275,313	1,351,726	371,814	....	1,652,144
1891	1,869,569	4,448,675	668,069	....	2,421,816
1892	235,206	3,254,849	663,927	....	2,698,507
1893	257,744	439,459	473,796	....	2,282,685
1894, to December 1	300	208	....	....	1,581,391
1895, to December 1	42,743	246	....	....	1,521,886
1896, to December 1	6,162,012	3,208,448	....	....	2,027,759
1897	8,916,452	5,797,517	....	....	3,151,164
1898	2,451,271	8,307,944	1,151,811	....	3,864,551
1899	7,619,862	2,745,970	....	....	2,960,070
1900	4,833,493	1,479,380	....	....	3,597,900
1901	233,907	1,050,006	....	....	2,128,169
1902	341,072	2,316,417	327,502	....	1,264,173
1903	308,616	1,310,550	321,243	....	1,475,104
1904	2,066,155	143	301,340	....	655,536
1905	5,304,708	271,010	288,734	....	1,426,751
1906	4,310,610	472,489	207,783	....	1,586,006
1907	133,580	1,128,070	137,588	....	1,651,730
1908	141,591	1,227,843	277,540	....	1,182,657
1909	238,567	187,496	104,593	....	850,554
1910	16,984	16,765	....	....	621,218

TOTAL *tonnage of all the property on the canals, ascending and descending, and the value for the seventy-four years preceding, is as follows:*

YEAR.	Tons.	Value.
1837	1,171,296	$55,809,288
1838	1,333,011	65,746,559
1839	1,435,713	73,399,764
1840	1,416,046	66,303,892
1841	1,521,661	92,202,929
1842	1,236,931	60,016,608
1843	1,513,439	76,276,909
1844	1,816,586	90,921,152
1845	1,977,565	100,629,859
1846	2,268,662	115,612,109
1847	2,869,810	151,563,428
1848	2,796,230	140,086,157
1849	2,894,732	144,732,285
1850	3,076,617	156,397,929
1851	2,582,733	159,981,801
1852	3,863,441	196,603,517
1853	4,247,853	207,179,570
1854	4,165,862	210,284,312
1855	4,022,617	204,390,147
1856	4,116,082	218,327,062
1857	3,344,061	136,997,018
1858	3,665,192	138,568,844
1859	3,781,684	132,160,758
1860	4,650,214	170,849,198
1861	4,507,655	130,115,893
1862	5,598,785	203,234,331
1863	5,557,692	240,046,461
1864	4,852,941	274,400,639
1865	4,729,651	256,237,104
1866	5,775,220	270,963,676
1867	5,688,325	278,956,712
1868	6,442,225	305,301,929
1869	5,859,080	249,281,284
1870	6,173,769	231,836,176
1871	6,467,888	238,767,691
1872	6,673,370	220,913,321
1873	6,364,782	191,715,500
1874	5,804,588	196,674,322
1875	4,859,958	145,008,575
1876	4,172,129	113,090,379
1877	4,955,963	128,923,890

Total tonnage of all property on the canals, etc. (Concluded).

YEAR.	Tons.	Value.
1878	5,171,320	$182,254,528
1879	5,362,372	285,280,726
1880	6,467,656	247,844,790
1881	5,179,192	162,153,565
1882	5,467,423	147,918,907
1883	5,664,056	147,861,223
1884	5,009,488	162,097,069
1885	4,731,784	119,536,189
1886	5,293,982	180,061,846
1887	5,553,805	159,245,977
1888	4,942,948	122,524,735
1889	5,370,369	154,584,222
1890	5,246,102	145,761,086
1891	4,563,472	116,269,343
1892	4,281,995	167,596,948
1893	4,331,963	154,831,094
1894	3,882,560	141,179,560
1895	3,500,314	97,453,021
1896	3,714,894	100,039,578
1897	3,617,804	96,063,338
1898	3,360,063	88,122,354
1899	3,686,051	92,786,712
1900	3,345,941	84,123,772
1901	3,420,613	83,478,880
1902	3,274,610	81,708,453
1903	3,615,385	77,713,325
1904	3,138,547	66,381,817
1905	3,226,896	57,918,586
1906	3,540,907	66,501,417
1907	3,407,914	63,903,970
1908	3,051,877	54,511,509
1909	3,116,536	59,081,572
1910	3,073,412	59,042,178

TOTAL GRAIN *received at Buffalo each year since* 1836, *and total grain, including flour, received each year.*

YEAR.	Grain, bushels.	Grain including flour, bushels.
1836	543,461	1,239,351
1837	550,560	1,184,685
1838	974,751	2,302,887
1839	1,117,262	2,302,851
1840	1,075,885	4,061,598
1841	1,852,325	5,692,525
1842	2,015,928	5,687,468
1843	2,055,025	6,642,610
1844	2,335,568	6,910,719
1845	1,848,040	5,581,790
1846	6,491,522	13,366,167
1847	8,688,187	19,153,187
1848	7,396,012	14,641,018
1849	8,628,013	14,665,189
1850	6,618,004	12,059,551
1851	11,449,661	17,740,784
1852	13,392,937	20,390,500
1853	11,078,741	15,956,525
1854	18,553,455	22,252,288
1855	10,788,473	24,472,277
1856	20,123,667	25,753,965
1857	15,348,930	19,578,690
1858	20,202,444	26,812,982
1859	14,429,069	21,530,722
1860	31,441,440	37,073,115
1861	50,062,646	61,460,601
1862	58,642,344	72,872,454
1863	49,845,065	64,735,510
1864	41,044,498	51,177,146
1865	42,473,223	51,415,188
1866	51,820,342	57,388,087
1867	43,499,780	59,700,060
1868	42,436,201	49,949,856
1869	37,014,728	45,007,163
1870	39,261,141	46,013,096
1871	60,765,457	67,155,742
1872	58,447,822	62,260,232
1873	67,340,570	73,636,595
1874	61,562,627	70,030,552
1875	65,194,716	74,246,726
1876	46,038,598	50,074,648
1877	61,734,071	66,199,291

Total grain received at Buffalo each year, etc.— (Concluded).

YEAR.	Grain, bushels.	Grain including flour, bushels.
1878	79,176,152	84,046,052
1879	74,379,829	78,865,354
1880	105,453,372	112,042,927
1881	56,806,545	62,062,895
1882	50,833,590	56,830,340
1883	65,722,080	76,079,930
1884	56,963,970	70,041,520
1885	49,740,060	64,260,460
1886	72,514,840	95,425,790
1887	84,730,910	104,737,710
1888	73,223,500	99,448,150
1889	90,869,880	118,273,430
1890	89,312,800	120,540,700
1891	128,993,020	164,459,720
1892	133,039,090	181,769,690
1893	135,919,920	188,730,370
1894	103,959,165	161,401,815
1895	118,027,930	162,936,630
1896	163,431,814	214,352,734
1897	185,443,816	242,140,306
1898	221,383,945	273,242,210
1899	153,393,184	194,293,112
1900	157,655,969	209,239,824
1901	132,641,828	187,909,664
1902	124,626,548	184,759,518
1903	140,438,822	196,653,957
1904	100,838,000	131,642,842
1905	126,465,729	177,496,229
1906	136,096,528	187,403,448
1907	132,438,798	181,237,178
1908	114,245,438	153,336,678
1909	113,415,385	152,896,845
1910	97,354,404	138,229,075

The following statement shows the receipts of flour, wheat and corn at Buffalo by lake for seventy-five years.

YEAR.	Flour, barrels.	Wheat, bushels.	Corn, bushels.
1836	139,178	304,990	204,355
1837	126,805	450,359	94,490
1838	277,620	933,117	34,148
1839	294,125	1,117,262	....
1840	597,142	1,004,561	71,337
1841	730,040	1,635,000	201,031
1842	734,408	1,555,420	453,520
1843	917,517	1,827,241	223,966
1844	915,030	2,174,500	137,978
1845	746,750	1,770,740	54,200
1846	1,374,529	4,744,184	1,455,258
1847	1,857,000	6,489,100	2,862,800
1848	1,249,000	4,520,117	2,298,000
1849	1,207,435	4,943,978	3,321,651
1850	1,103,039	3,681,347	2,593,378
1851	1,258,224	4,167,121	5,988,775
1852	1,299,213	5,549,778	5,136,746
1853	975,557	5,420,043	8,065,793
1854	739,756	5,510,782	10,108,983
1855	937,761	8,022,126	9,711,430
1856	1,126,048	8,465,671	9,633,277
1857	845,953	8,334,179	5,713,611
1858	1,536,109	10,671,550	6,621,688
1859	1,420,383	9,234,652	3,113,653
1860	1,122,335	18,502,615	11,386,217
1861	2,159,591	27,105,219	21,024,657
1862	2,846,022	30,435,831	24,388,627
1863	2,978,088	21,240,348	20,086,912
1864	2,028,520	17,677,519	10,478,681
1865	1,788,393	13,437,888	19,840,901
1866	1,313,543	10,479,694	27,894,798
1867	1,440,056	11,879,685	17,873,638
1868	1,502,731	12,555,215	16,804,067
1869	1,598,487	19,228,546	11,549,403
1870	1,470,391	20,556,722	9,410,128
1871	1,278,077	22,606,217	26,110,769
1872	762,502	14,304,942	34,643,180
1873	1,259,205	30,618,372	28,550,828
1874	1,693,585	29,778 572	24,974,548
1875	1,810,402	32,987,656	22,593,891
1876	807,210	19,324,612	20,939,853

Receipts of flour, wheat and corn at Buffalo by lake.— (Concluded).

YEAR	Flour, barrels.	Wheat, bushels.	Corn, bushels.
1877	693,044	23,284,405	33,362,866
1878	911,980	35,419,136	35,133,853
1879	897,105	37,788,501	32,990,993
1880	1,317,911	40,510,229	62,214,617
1881	1,051,250	18,495,320	34,434,830
1882	1,199,350	26,050,030	21,664,530
1883	2,071,570	24,105,420	34,775,040
1884	2,615,510	2,469,710	18,538,340
1885	2,993,280	27,130,400	21,028,230
1886	4,582,190	41,430,440	29,155,370
1887	4,001,360	48,111,180	30,199,490
1888	5,244,930	27,548,110	36,422,270
1889	5,480,710	26,051,600	47,127,150
1890	6,245,580	14,868,630	44,136,660
1891	7,093,340	76,945,960	29,616,390
1892	9,746,120	78,243,560	32,377,780
1893	10,562,090	68,243,750	40,539,976
1894	11,488,530	50,194,130	29,078,520
1895	8,971,740	46,484,510	38,244,960
1896	10,384,184	54,411,207	47,811,210
1897	11,339,298	50,584,719	55,553,741
1898	10,371,653	83,872,837	67,950,073
1899	8,810,097	48,232,016	53,503,404
1900	11,463,079	47,826,458	63,192,660
1901	11,053,439	61,294,248	30,539,848
1902	12,026,616	62,452,696	22,487,454
1903	11,243,027	40,455,328	43,364,979
1904	6,160,965	26,270,000	27,898,000
1905	10,201,100	40,436,616	32,745,046
1906	10,279,384	55,544,832	25,976,478
1907	9,759,676	66,658,138	28,477,767
1908	7,818,248	63,857,080	13,779,988
1909	7,899,292	61,084,797	16,027,578
1910	7,231,580	50,450,911	22,992,368

The following statement shows the receipts of oats, barley and rye at Buffalo by lake for seventy-five years

YEAR.	Oats, bushels.	Barley, bushels.	Rye, bushels.
1836	28,640	4,876	1,500
1837	2,533	....	3,260
1838	6,577	....	909
1939	....	....	....
1840	....	....	....
1841	14,144	....	2,150
1842	....	4,710	1,268
1843	2,489	....	1,332
1844	18,017	1,617	456
1845	23,300	....	....
1846	218,300	47,530	28,250
1847	446,000	....	70,787
1848	560,000	....	17,789
1849	362,384	....	....
1850	357,580	3,627	....
1851	1,140,430	142,773	10,652
1852	2,596,231	497,913	112,251
1853	1,580,655	401,098	107,152
1854	4,401,739	313,757	177,066
1855	2,693,222	62,304	299,591
1856	1,733,382	46,327	245,810
1857	1,214,760	37,844	48,536
1858	2,275,231	308,374	125,214
1859	394,502	361,550	124,693
1860	1,209,594	262,158	80,822
1861	1,797,905	313,715	337,764
1862	2,624,982	428,124	791,564
1863	6,322,187	641,440	422,309
1864	11,682,637	465,097	633,726
1865	8,494,799	820,563	877,677
1866	10,227,472	1,606,384	1,245,485
1867	10,933,166	1,802,598	1,010,693
1868	11,492,472	637,124	947,323
1869	5,459,347	651,339	126,093
1870	6,846,983	1,821,154	626,154
1871	9,006,409	1,942,928	1,095,009
1872	6,050,045	3,088,925	301,809
1873	5,972,346	1,232,507	906,977
1874	5,396,781	1,154,948	167,301
1875	8,494,124	906,889	222,126
1876	2,397,257	2,615,081	761,795
1877	4,279,229	1,652,568	1,155,003

Receipts of oats, barley and rye at Buffalo by lake.— (Concluded).

YEAR.	Oats, bushels.	Barley, bushels.	Rye, bushels.
1878	5,122,972	1,375,184	2,135,007
1879	1,101,794	600,740	1,884,802
1880	649,350	335,925	743,451
1881	3,565,737	282,510	22,210
1882	1,620,170	701,500	767,360
1883	3,226,900	583,800	2,830,830
1884	3,174,730	534,130	2,247,060
1885	767,580	577,230	309,370
1886	1,014,670	787,730	126,630
1887	4,656,280	1,459,420	304,540
1888	7,897,310	842,090	513,720
1889	4,309,800	1,474,570	1,906,760
1890	13,860,780	5,165,700	1,281,030
1891	12,454,150	4,373,120	5,603,400
1892	16,500,250	4,600,970	1,316,530
1893	20,700,150	5,791,460	644,590
1894	15,560,230	8,625,090	501,195
1895	21,943,680	10,253,440	787,340
1896	40,107,499	16,697,744	4,404,354
1897	59,815,210	12,858,741	6,631,405
1898	45,501,233	11,391,332	6,821,694
1899	26,423,358	15,008,426	2,084,643
1900	28,422,256	9,868,196	1,314,743
1901	21,438,545	7,687,239	1,256,284
1902	15,891,387	8,969,865	3,716,628
1903	30,976,088	10,681,655	3,216,983
1904	19,124,000	15,665,000	1,736,600
1905	25,733,094	14,618,495	688,450
1906	23,951,155	13,681,058	1,243,640
1907	11,272,858	11,264,101	1,313,154
1908	10,455,716	11,649,064	856,944
1909	13,110,014	12,765,503	655,684
1910	12,366,891	11,207,763	336,471

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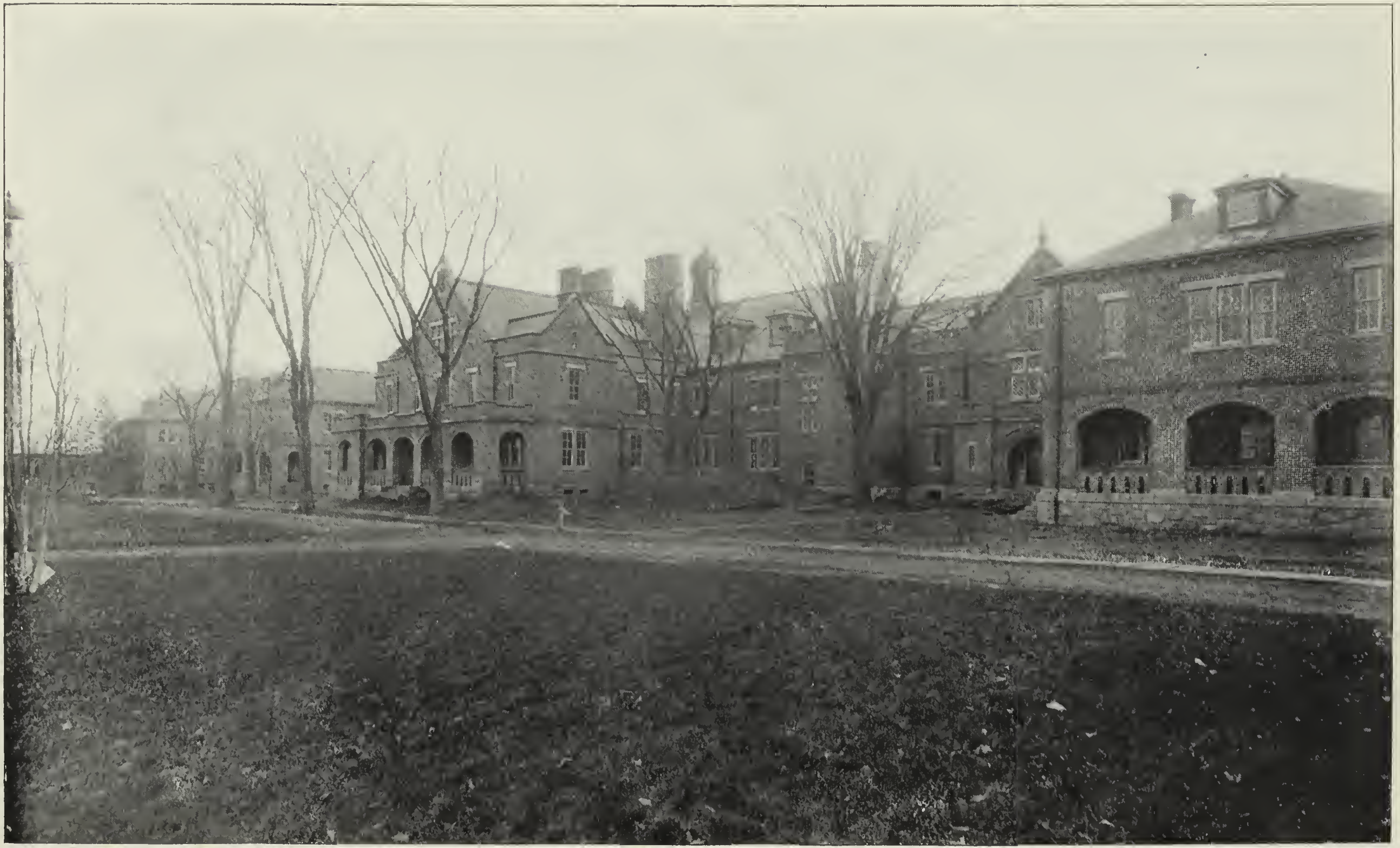

New Ward Buildings "B" and "C."

SIXTEENTH ANNUAL REPORT

OF THE

BOARD OF MANAGERS

OF THE

Rome State Custodial Asylum

AT ROME, N. Y.

For the Year Ending September 30, 1910

Adopted at the Annual Meeting, December 5, 1910

TRANSMITTED TO THE LEGISLATURE JANUARY 26, 1911

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1911

STATE OF NEW YORK

No. 17.

IN ASSEMBLY

January 26, 1911.

REPORT OF THE BOARD OF MANAGERS.

To the Legislature of the State of New York:

GENTLEMEN.—As provided for in chapter 462, Laws of 1904, we respectfully transmit to your honorable body this, the sixteenth annual report of the Rome State Custodial Asylum for the fiscal year ending September 30, 1910.

Respectfully yours,

RUDOLPHUS C. BRIGGS,
President.
CYRUS J. SEVERANCE,
Vice-President.
EDWIN F. TORREY, JR.,
Secretary.
JAMES A. DOUGLASS,
THOMAS W. SINGLETON,
ARCHER D. BABCOCK,
STODDARD M. STEVENS.

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OFFICERS OF THE ASYLUM.

MANAGERS.

TERM OF OFFICE EXPIRES IN 1911.

DR. ARCHER D. BABCOCK	Syracuse
HON. R. C. BRIGGS	Rome

TERM OF OFFICE EXPIRES IN 1913.

MR. EDWIN F. TORREY, JR	Clinton
MR. THOMAS W. SINGLETON	Rome
HON. JAMES A. DOUGLASS	Oriskany Falls

TERM OF OFFICE EXPIRES IN 1916.

DR. CYRUS J. SEVERANCE	Mansville
MR. STODDARD M. STEVENS	Rome

Officers.

HON. R. C. BRIGGS	President
DR. CYRUS J. SEVERANCE	Vice-President
MR. EDWIN F. TORREY, JR	Secretary
DR. CHARLES BERNSTEIN	Treasurer

Resident Officers.

CHARLES BERNSTEIN, M. D	Superintendent
MAXWELL C. MONTGOMERY, M. D	Physician
AUSTIN G. MORRIS, M. D	Physician
MORTIMER G. BROWN, M. D	Assistant Physician
FRED S. SMITH	Steward
MARIANNE BAYNE	Matron

ADMINISTRATIVE ASSISTANTS.

K. S. PUTNAM	Bookkeeper
FRED W. HITCHCOCK	Storekeeper
EMMA N. JONES	Stenographer
CHARLES L. CONKLIN	Supervisor Brush Farm Colony
ADELBERT WOLCOTT	Supervisor Bailey Farm Colony
JULIA CULLY	Supervisor Female Group
MARY CROUGH	Supervisor Building “J”
LOUISE M. O'NEILL	Supervisor Building “D”
CHARLES LAUFER	Supervisor Building “E”
JENNIE D. JOHNSON	Supervisor Kitchen Building
JAMES D. McPHEE	General Night Watch
GEORGE TEAL	Farmer
THOMAS HOLLERAN	Gardner
SOREN P. ANDERSON	Chief Engineer
FRED GERWIG	Carpenter
STEPHEN J. BURNS	Supervisor Laundry
MARY I. DOUGLASS	Director of Training School

SIXTEENTH ANNUAL REPORT

OF THE

BOARD OF MANAGERS OF THE ROME STATE CUSTODIAL ASYLUM.

To the Legislature of the State of New York:

As provided in the organic law governing this asylum, we present herewith our sixteenth annual report.

Our population has increased during the year from 1,041 to 1,110, the daily average having been 1,063 as compared with 1,009 last year. This increase in population, with no increase in ward space for inmates, has necessitated additional crowding in all the buildings. However, we felt it our duty to accept new cases from time to time as application was made for especially needy ones, as we could look forward to the early opening of the new buildings "B" and "C" in the late autumn or early winter, at which time all crowding can be relieved through transferring the excess of inmates from the old to the new buildings.

The opening of the new buildings will again afford us an opportunity for better classification and segregation of patients which will add much to the patients' comfort as well as to orderly management.

We continue to feel the need for larger accommodation for this class of the State's wards, as we have on file over five hundred applications for suitable cases. However, we are of the opinion that no great enlargement of accommodation for additional numbers should be made at this asylum, at least until Letchworth Village has a number as large as ours, and the Newark asylum is in a position to receive all the females from this asylum.

We do need, however, some additional buildings and farm land to complete the existing plant and render administration economical and practical. Thus we need a suitable hospital building for the proper isolation and care of the sick, a building for the proper isolation of all cases of tuberculosis, an enlarged laundry for the proper handling of the patients and employees clothing, fire-proofing the two old buildings, " D " and " E," a detached building for shops for general repair work, additional farm colonies, a creamery for making butter, a greenhouse and a railroad switch.

We request appropriations from the Legislature of 1911 as follows:

General hospital	$50,000
Tuberculosis hospital	50,000
Shops	20,000
Addition to laundry	10,000
Fencing, ditching and drainage	5,000
Repair and equipment	5,000
Farm lands	10,000
Fire-proofing building " E "	15,000
Fire-proofing stairs in building " D "	5,000
Maintenance	200,000

Funds were available and expended during the year, as per the treasurer's report attached hereto. And with these moneys we have been able, in addition to providing ordinary maintenance, to make many needful repairs and improvements, as placing porches on the Brush and Bailey farm houses, repairing the barn at the Bailey farm, placing woven wire fences along all public highways surrounding the farms, placing out additional fruit trees, ditching and draining farm lands, installing a new boiler in the power house, grading and planting lawns, repainting all frame buildings, placing wires to electric lights about the lawns in conduit under ground, and securing additional farm machinery.

A new sewage disposal plant is in process of construction which will be completed this fall.

PAROLE AND DISCHARGE OF INMATES.

It frequently happens that patients are committed to this asylum who are feeble-minded, only temporarily, as a result of lack of proper nutritition from faulty or insufficient diet, or as a result of extreme physical or nervous exhaustion following physical disease, as typhoid or some other febrile state, or from excessive masturbation, and such patients frequently improve after a residence of one or two years in the asylum, and parents or relatives then wish to take such improved patients home with them on trial as to their ability to lead an ordinary family life, and also frequently a feeble-minded boy or girl is committed to the asylum because of parental casualty, as the loss of the father, mother, or other means of support, and later parental or family stability is again established and the patient in the meantime has considerably improved and learned to work, and thus the parents or relatives wish the child back under the parental roof or a member of the home circle. Therefore, it often becomes necessary to determine whether or not such patients are sufficiently improved so as to lead a normal life outside of the asylum in their homes or elsewhere, and the only means of surely determining whether or not such person can be properly cared for outside of the asylum is to give the person a trial; thus often during the past several years it has been our custom to frequently parole inmates, allowing them to go home for a visit over the holidays or for a couple of weeks in summer time, and in other cases to allow the patient to go home for a month or so to demonstrate whether or not such patient could live at home with parents or friends.

In almost every instance the friends have borne the expense in connection with the parole. However, during the year 1909 two or three inmates were allowed to go on parole and some expense was incurred. The fiscal supervisor's department withheld approval of such expenditure.

At the November meeting of the board of managers the matter of the parole of inmates was discussed, and on motion of Manager Stevens, seconded by Manager Severance, and carried: The chair was instructed to appoint a committee of two, of which the chairman should be one, to look up the matter of providing some legal procedure for the parole of inmates where there is a question involved whether or not the inmate should be discharged. Managers Stevens and Briggs were made such a committee.

At the December meeting of the board of managers the committee on the parole and discharge of inmates asked for further time for consideration of the subject, as it was thought desirable to consult with the Attorney-General regarding the matter.

On December 14th we received a communication from the fiscal supervisor, stating that the Attorney-General had decided that we had no right to parole inmates and the fiscal supervisor had no right to approve expenditure therefor.

At the January meeting of the board of managers the special committee on the parole of inmates was granted an extension of time to further consider the matter, and the committee in connection with the superintendent reviewed the matter in considerable detail and came to the conclusion that it was better not to attempt to institute a legal system of parole, but rather to discharge inmates whenever in the opinion of the board such inmate should be allowed to leave the asylum.

The Attorney-General was then asked to prepare a legal form of petition for the discharge of inmates, pursuant to chapter 339, Laws of 1909, and the forms thus prepared are now required to be duly filled out and presented to the board together with the recommendation of the committing official in connection with all requests for the discharge of inmates.

In conclusion, it affords us great pleasure to express our hearty commendation of the officers and employees of the asylum for their uniform faithfulness to duty, and we desire to publicly express our hearty appreciation of their work in behalf of the unfortunate persons committed to their care, and also we bespeak their continued kindly and considerate care of the State's wards which it is our sworn duty to foster and protect.

Respectfully submitted by managers,
R. C. BRIGGS,
C. J. SEVERANCE,
S. M. STEVENS,
EDWIN F. TORREY,
J. A. DOUGLASS,
THOMAS W. SINGLETON.

TREASURER'S REPORT.

To the Managers of the Rome State Custodial Asylum:

Gentlemen.— I hereby respectfully submit the annual report of the receipts and expenditures for the year ending September 30, 1910.

GENERAL FUND.

On hand October 1, 1909	$8 06	
General appropriation	168,000 00	
		$168,008 06

Disbursements.

Salaries and wages	$68,042 67	
Expenses of managers	428 00	
Provisions	37,470 39	
Household stores	7,054 58	
Clothing	13,109 68	
Fuel and light	19,875 23	
Hospital and medical	1,203 18	
Shop, farm and garden	12,433 98	
Ordinary repairs	1,473 45	
Miscellaneous	4,498 41	
		165,589 57
Balance on hand September 30, 1910		$2,418 49

SUMMARY.

ESTIMATES NOS. 1 TO 12 INCLUSIVE.

	Total expense.	Per capita.	Home products consumed.	Per capita.
1 and 2. Officers and employees	$68,042 67	$63 97	....	....
3. Expenses of managers	428 00	40	....	....
4. Provisions	37,470 39	35 23	$19,810 90	$18 63
5. Household stores	7,054 58	6 63	....	....
6. Clothing	13,109 68	12 33	....	....
7. Fuel and light	19,875 23	18 69	....	....
8. Hospital and medical	1,203 18	1 13	....	....
9. Shop, farm and garden	12,433 98	11 69	5,189 27	4 88
10. Ordinary supplies	1,473 45	1 39	....	....
12. Miscellaneous	4,498 41	4 23	....	....
Total	$165,589 57	$155 68	$25,000 17	$23 50

Average number of patients	1,063 62
Per capita cost	$155 68
Per capita cost, home product	23 50
Per capita cost including home products	179 19

SPECIAL FUNDS.

Received from Comptroller		$151,871 02

Disbursements.

Repair and equipment, 469, '08	$46 16	
Employees building	22 75	
Repair and equipment, 508, '10	241 80	
Building to replace "C"	29,981 02	
Fencing, ditching, etc	226 85	
Fruit and shade trees	28 32	
Ice pond	78 58	
Construction of buildings	106,268 40	
Boilers and connections	3,000 00	
Sewage disposal	1,773 12	
Grading and planting lawns	109 75	
Repair and equipment, 461, '09	7,896 41	
Reconstruction N. end Building "C".	1,975 50	
Granolithic floor	194 36	
Furnish employees' building	28 00	
		151,871 02

New buildings	$139,998 04	
Equipment	6,402 82	
Extraordinary repairs	5,470 16	
		$151,871 02

STATEMENT OF SPECIAL FUNDS OCTOBER 1, 1910.

		Unused Appropriations.	Unestimated.	Unused Estimates.
Separating and sewage system	508–10–AA	$5,000 00	$1,118 48	$3,881 52
Alteration, steam system	508–10–BB	7,500 00	7,500 00	....
Furnishing new buildings	508–10–CC	10,000 00	10,000 00	....
Repair and equipment	508–10–DD	2,758 20	957 71	1,800 49
Building to replace "C"	513–10–EE	4,972 56	2,374 50	2,598 06
Fencing, ditching, etc	513–10–FF	43 41	34 85	8 56
Sewage disposal plant	513–10–GG	2,000 00	2,000 00	....
Fruit and shade trees	513–10–HH	279 37	....	279 37
Ice pond	513–10–II	14 99	66	14 33
Construction of buildings	151–09–A	47,552 79	1,479 88	46,072 91
Boilers and connections	461–09–D	1,000 00	1,000 00	....
Sewage disposal	461–09–E	4,226 88	....	4,226 88
Grading and planting lawns	461–09–F	390 25	....	390 25
Repair and equipment	461–09–G	1,490 12	110 27	1,379 85
Granolithic floor	433–09–I	38 49	2 00	36 49
Furnish employes' building	433–09–J	1 76	1 76	....
Water supply system	433–09–K	1,000 00	400 00	600 00
Total	....	$88,268 82	$26,980 11	$61,288 71

SPECIAL FUNDS AVAILABLE.

Amount.	TITLES, ETC.	Available October 1, 1909.	Used.	Available September 30, 1910.
	Appropriated, Chapter 427, *Laws* 1902.			
	Reapproprtated, Chapter 429, *Laws* 1904.			
	Reappropriated, Chapter 686, *Laws* 1906.			
	Reappropriated, Chapter 466, *Laws* 1908.			
	Reappropriated, Chapter 513, *Laws* 1910.			
$500 00	Fruit and shade trees	$307 69	$28 32	$279 37
500 00	Ice pond	93 57	78 58	14 99
	Appropriated, Chapter 727, *Laws* 1904.			
	Reappropriated, Chapter 686, *Laws* 1906.			
	Reappropriated, Chapter 466, *Laws* 1908.			
2,600 00	Wiring cottages C, D and E	13 20	0 00	*13 20
	Appropriated, Chapter 703, *Laws* 1905.			
	Reappropriated, Chapter 686, *Laws* 1906.			
	Reappropriated, Chapter 466, *Laws* 1908.			
60,000 00	Dormitory building and equipping same	4 37	0 00	*4 37
	Appropriated, Chapter 374, *Laws* 1906.			
	Reappropriated, Chapter 466, *Laws* 1908.			
50,000 00	Employes' building	24 08	22 75	*1 33
	Appropriated, Chapter 374, *Laws* 1906.			
	Reappropriated, Chapter 466, *Laws* 1908.			
	Reappropriated, Chapter 513, *Laws* 1910.			
2,000 00	Sewage disposal plant	2,000 00	0 00	2,000 00
	Appropriated, Chapter 571, *Laws* 1907.			
	Reappropriated, Chapter 433, *Laws* 1909.			
4,500 00	Reconstruct north end building C	1,975 50	1,975 50	0 00
300 00	Granolithic floor	232 85	194 36	38 49
3,500 00	Furnishing employees' building	29 76	28 00	1 76
1,000 00	Water supply system	1,000 00	0 00	1,000 00

	Appropriated, Chapter 469, *Laws* 1908.			
1,000 00	Machinery for repair shop	3 14	0 00	*3 14
3,500 00	Repair and equipment	4 24	46 16	*1 08
	Appropriated, Chapter 469, *Laws* 1908. *Reappropriated, Chapter* 513, *Laws* 1910.			
35,000 00	Building to replace C	34,953 58	29,981 02	4,972 56
1,000 00	Fencing, ditching, etc	270 26	226 85	43 41
	Appropriated, Chapter 151, *Laws* 1909.			
165,000 00	Construction of buildings	153,821 19	106,268 40	47,552 79
	Appropriated, Chapter 461, *Laws* 1909.			
4,000 00	Boilers and constructions	4,000 00	3,000 00	1,000 00
6,000 00	Sewage disposal	6,000 00	1,773 12	4,226 88
500 00	Grading and planting lawns	500 00	109 75	390 25
10,000 00	Repairs and equipment	9,386 53	7,896 41	1,490 12
		$214,662 96	$151,629 22	$63,033 74
	*Lapsed	23 12	....	$23 12
		$214,639 84	....	$63,010 62
	Appropriated, Chapter 508, Laws 1910	$25,500 00	....	....
5,000 00	Separating and sewage system	....	....	$5,000 00
10,000 00	Furnishing new buildings	....	....	10,000 00
7,500 00	Alterations to steam system	....	....	7,500 00
3,000 00	Repair and equipment	....	$241 80	2,758 20
		$240,139 84	$151,871 02	$88,268 82

SUPERINTENDENT'S REPORT.

To the Honorable R. C. Briggs, President Board of Managers of the Rome State Custodial Asylum:

SIR.— Herewith, in conformity with the by-laws governing this asylum, I have the honor to transmit to you this, the sixteenth annual report of the superintendent of the asylum.

A review of the movement of population shows that 100 males and 50 females were admitted during the year, and that of this number 81 (48 boys and 33 girls) were below 16 years of age, and while it may appear strange that this asylum, and not Syracuse, should receive children of this age, still the facts are that all the children between 7 and 14 years of age received here have actually been declined admission at Syracuse, either because of bodily infirmity, low grade of mentality, or because of lack of room at Syracuse for additional cases.

Of this number 12 boys and 6 girls will in the early autumn be sent to Syracuse in exchange for lower grade or older cases, thus giving these brighter children the benefit of the special schooling which they can receive at Syracuse, as we maintain here schools for manual and industrial training only and no school of letters.

Fifty-one cases died during the year, and 28 were transferred as follows: Twenty-one boys and 3 girls went to their homes, and 4 epileptics were sent to Craig Colony. Of the deaths, 12 died of pneumonia and 17 from tuberculosis, and herein are we again warned of the need for a separate department for the care of tuberculous cases, as the number of cases and deaths from this disease continues to increase from year to year, even though we do our very best, with our limited accommodations, to isolate all infectious cases. Statistics collected during the year show that 10 per cent. of our population is tuberculous, and of this number about one-half is in the incipient stages.

MAINTENANCE.

It is gratifying to note that we have been able to lower the per capita cost of maintenance, even in the face of constantly increasing price of nearly all commodities required for our daily use.

A glance at the treasurer's report will show that there has been a per capita reduction under nearly all the divisions of the classification, and with the increased price of clothing and provisions, especially, this could only be brought about through a diminished per capita allowance of these articles, as the amounts needed are fairly fixed quantities, and for articles like clothing, bedding and household supplies, a diminished allowance one year, invariably entails an increased demand for the next year to meet the deficiency.

A small saving was instituted during the summer months through the substitution of fresh and salt fish and eggs in lieu of meats, especially pork supplies, thus allowing our home product, ham, bacon and salt pork, to meet our daily needs for these articles of food and purchasing none of these on the open market.

Ordinary repairs have always appeared ridiculously small, and one might well judge from these figures that repairs about the institution were almost wholly neglected, still a further analysis of all expenditures will reveal the fact that many articles and considerable labor used in making such repairs are classified under other headings than ordinary repairs, and while it is never possible with the shortage of labor and materials allowed to keep all repairs up to date, yet conditions are not as bad as one might be led to believe from a casual review of the financial statements. In former years a considerable amount of ordinary repairs has been carried on from special funds, such as a repair and equipment fund which has been regularly appropriated to the various institutions year after year for the past eight years, and such expenditures being made from special funds do not appear in the regular per capita maintenance statement. Now that a new policy is to apply and all ordinary repairs are to be charged against the regular maintenance fund, a larger allowance for the purpose will be necessary.

It is always discouraging to assistants and employees to see needed repairs drifting along for days and even weeks and months before they are made, they well knowing that what was a small repair in the beginning will, if neglected, soon become a large repair, and thus the employees get the impression, much to the detriment of the service, that the same attention that is given to repairs is the standard of service required in other lines of work.

SEPARATION OF SEX.

The new group of buildings have been planned with reference to the maintaining of but one, the male, sex at this asylum, in conformity with the recommendation and agreement of the conference of representatives of the State Board of Charities, and the State Charities Aid Association, and representatives of the Syracuse, Newark and Rome boards of managers; thus the separation of the asylum into distinctive male and female departments as formerly is somewhat broken up, as the new building "B" occupies the center of the whole group and is located partially on what was formerly the female side and partially on what was formerly the male side and, therefore, it is very important that the removal of the females be consummated at the very earliest date possible.

OPENING MAIL FOR PATIENTS.

A question arose regarding the delivery and opening by officers of the asylum of letters and packages addressed through the United States mail directly to inmates of the asylum, and on February 12, 1910, we requested Hon. Edward R. O'Malley, Attorney-General of the State of New York, to render an opinion as to the legality of our opening and inspecting such mail in cases where we are suspicious of the contents being suitable or allowable to the inmate, or when the inmates are unable to open or read their own mail.

The Attorney-General's opinion follows:

Section 1431 of the Postal Laws and Regulations (1893), provides: "Any person who shall take any letter, postal card or packet, although it does not contain any article of value or evidence thereof, out of a post office or branch post office, or from a letter or mail carrier, or which has been in any post office or branch post office, or in the custody of any letter or mail carrier, before it has been delivered to the person to whom it was directed, with a design to obstruct the correspondence, or pry into the business or secrets of another, or shall secrete, embezzle, or destroy the same, shall for every such offense be punishable by a fine of not more than five thousand dollars or by imprisonment at hard labor for not more than one year, or by both."

Based on this section is the following regulation No. 382, which may be found at page 91 of the Postal Laws and Regulations (§ 451, P. L. & R., 1893):

"A letter once placed in the post office is in the custody of the Department for transmission and delivery to the party addressed. Neither postmasters nor officers of the law have any authority to open it under the pretext that there might be something improper or even criminal in it, or that would aid in the detection, or furnish evidence for the conviction of offenders against the law."

Hon. John L. Thomas, Assistant Attorney-General for the Post Office Department, in a communication dated December 20, 1893, made the following decision:

" The authorities in control of the asylum have no right to open and inspect letters addressed to or sent by the inmates under their care and in their custody without their consent. This ruling does not preclude such authorities, however, from preventing the delivery of letters to such inmates or to prevent letters from being sent by them to outside parties, when it might, in their judgment, probably interfere with the safe and due administration of the affairs of such institution. Of course, here as elsewhere, a sound discretion should be exercised in this respect, and with that the Post Office Department would be content."

I understand this decision is still in full force and effect. The State Charities Law, section 92, provides:

" The Board of Managers shall * * * 2. Establish by-laws, rules and regulations subject to the approval of the State Board of Charities for the internal government, discipline and management of the asylum."

The official orders and regulations of the State Lunacy Commission, Form 40, subd. 2, provide:

"When a lawfully adjudged and committed lunatic, who is an inmate of a hospital or asylum, has no guardian or committee, lawfully appointed, mail matter addressed to such inmate and delivered, in pursuance of the foregoing direction of the post office department, to the keeper or superintendent of the hospital or asylum, may, in the discretion of such keeper or superintendent, be delivered to such inmate unopened, if, in his judgment, it is safe to do so; or, if he has a well grounded reason to believe that to deliver such mail matter to such patient would be unsafe or unwise and prejudicial to the interests of such patient or of the institution, *such keeper or superintendent may withhold such mail matter for examination and detention or destruction, if deemed advisable, always having due regard to the prevailing rule as to the inviolability of mail matter and seeking to maintain it whenever it is practicable or proper to do so.*"

Therefore, under the ruling of the Post Office Department and the statute governing charitable institutions, which I have already quoted, you have no right to open mail addressed to inmates, but you have the right and authority to make rules and regulations subject to the approval of the State Board of Charities preventing the delivery of letters to such inmates or to prevent letters from being sent by them to outside parties when it might, in your judgment, probably interfere with the safe and due administration of the affairs of such institution.

Respectfully yours,
EDWARD R. O'MALLEY,
Attorney-General.

FARM COLONIES.

Our two farm colonies have continued to prove themselves successful during the past year, making even a better financial showing than ever before. They have been considerably better than self-supporting, and we hope no time will be lost in establishing more such colonies.

With our improved barns and increased herd of cows which we have grown at the farm colonies, born and raised on the farms, we will be well able, beginning April 1, 1911, to produce all the butter we use (we are now purchasing over a ton every month), providing money is allowed for building a creamery for this purpose.

It will cost about $500 to build, with inmate labor, a suitable concrete building. This is less than the amount we have expended for butter each month for the past several years.

In closing this annual report I wish to again thank my associate officers and employees for their every ready and continuous kindly assistance and co-operation in the management of the affairs of the asylum, and to assure the managers that we are all thoughtful of and thankful for their gratuitous interest and work in our behalf, as well as that of the asylum and its inmates.

Respectfully,

CHARLES BERNSTEIN,

Superintendent.

REPORT OF THE STEWARD.

FARM AND GARDEN PRODUCE CONSUMED DURING THE YEAR.

Apples, 17 bushels	$12 50
Alfalfa, 10 tons	20 00
Asparagus, 530 bunches	53 00
Brussels sprouts, 1¾ bushels	4 13
Bacon, 2,874 pounds	414 80
Beef, dried, 318 pounds	77 55
Beef, corned, 2,694 pounds	304 98
Beef, fresh, 206 pounds	16 48
Beans, string, 261 15/16 bushels	104 78
Beans, lima, 24 31/84 bushels	24 16
Beans, dried, 5 bushels	11 25
Beets, 1,227 bunches	122 70
Beets, 238 1/16 bushels	93 00
Beets, stock, 681 bushels	68 10
Blackberries, 266 quarts	26 60
Cabbage, 9,380 heads	357 35
Cauliflower, 2800 heads	16 80
Carrots, 233 13/16 bushels	113 43
Carrots, 10 bunches	30
Canned goods, 656⅓ dozen	728 68
Celery, 2,156 heads	43 12
Chickens, dressed, 365½ pounds	58 99
Corn, fodder, 75 tons	150 00
Corn, green, 3,512 1/6 dozen	351 22
Corn, State, 718 bushels	287 20
Corn, pop, 5⅛ bushels	5 13
Corn, seed, 1 bushel	2 50
Corn on ear, 912 6/7 bushels	365 14
Currants, 796 quarts	79 60
Cucumbers, 10,067	61 89

Ducks, 42 pounds	$7 56
Eggs, 800 dozen	187 45
Ensilage, 194 tons	395 00
Fodder, green (peas, oats and rye), 70 tons	70 00
Geese, 69 pounds	12 42
Gooseberries, 41 quarts	4 10
Grapes, 429 quarts	12 87
Ham, 8,080 pounds	1,111 49
Hay, 212 17/40 tons	2,437 40
Ice, 1,200 tons	2,400 00
Kraut, 52 barrels	208 00
Lard, 1,769 pounds	208 84
Lettuce, 3,291 heads	110 16
Milk, 61,402.70 gallons	7,368 34
Manure, 750 loads	750 00
Manure, pig, 100 loads	200 00
Millet, 35 tons	35 00
Muskmelons, 36	3 60
Onions, 302⅞ bushels	206 13
Onions, 1,447 bunches	28 94
Oats, 268¾ bushels	134 38
Parsley, 3 bunches	09
Potatoes, seed 312 bushels	124 80
Potatoes, 4,025½ bushels	2,014 25
Parsnips, 264¾ bushels	158 85
Pigs' feet, 762 pounds	22 86
Peas, green, 186⅝ bushels	140 66
Peppers, 500	2 50
Pork, fresh, 7,211 pounds	891 72
Pork, salt, 8,204 pounds	898 39
Pie plant, 2,737 pounds	27 37
Plums, 1 15/32 bushels	2 20
Pumpkins, 21	1 26
Radishes, 298 bunches	5 96
Raspberries, 410 quarts	41 00
Rhubarb, 35 pounds	35
Sausage, 1,101 pounds	120 84
Strawberries, 478 quarts	47 80

Straw, 10 tons	$82 00
Squash, summer, 538	12 22
Spinach, hubbard, 815 pounds	24 45
Spinach, 24½ bushels	18 75
Salsify, 7 bushels	3 51
Syrup, maple, 38 gallons	39 95
Sage, 28 bunches	1 40
Tomatoes, 147⅞ bushels	75 04
Turnips, 603⅜ bushels	184 53
Turkeys, 39 pounds	7 80
Veal, 1,702 pounds	174 68
Vinegar, 63 gallons	7 88
	$25,000 17

FRED S. SMITH,
Steward.

REPORT OF FARMER.

	Acres.	Product.	Value.
Farm	543½	......	....
Meadow (hay, ton)	86	184	$2,208 00
Pasture (feed for 90 head)	187	......	720 00
Oats, bushels	16¼	558	244 36
Straw (ton)	...	18	144 00
Corn, fodder (ensilage, ton)	15	250	625 00
Corn stalks (ton)	...	114	285 00
Corn, green, for canning	31	......	936 05
Corn, State, bushels	3	365	164 25
Peas, green, for canning	6	......	257 01
Potatoes, bushels	30½	4,270	2,135 00
Beets, bushels	1¼	1,000	100 00
Alfalfa	2	2	20 00
Millet	4	15	15 00
Turnips	¼	450	135 00
Corn, pop, bushels	1½	100	100 00
Buckwheat, bushels	6	150	90 00
Pumpkins, pounds	...	97,560	195 12
Rye, bushels	3	65	52 00
Rye, straw, tons	...	4	48 00
Green fodder, tons	5	60	60 00
Ice, tons	2	1,200	2,400 00
			$10,933 79

Trees (all young):

Apple, no yield	497
Pear, no yield	59
Plum, no yield	59
Cherry, no yield	77

Cost of Operation:

Farmer	$1,744 00
Teamsters and horses	1,776 00
Fertilizer	531 75
Fertilizer, home product	750 00
Seeds	487 88
Implements, repairs, etc	250 00
	$5,538 63

DAIRY PRODUCTS.

Milk, 61,402.70 gallons	$7,368 34	
Beef, 3,012 pounds	382 53	
Veal, 1,702 pounds	174 68	
Manure, 750 loads	750 00	
Value of live stock on hand Oct. 1, 1910, 124	5,890 00	
		14,565 55
Cost of Operation:		
Live stock on hand Oct. 1, 1909, 115 head	$4,117 00	
Feed purchased:		
Feed, 56¾ tons	1,480 88	
Labor	1,614 00	
Bedding	250 00	
Repairs and appliances	30 00	
		7,491 88

Home products feeds:

Hay, 175 tons	$1,750 00
Ensilage, 320 tons	800 00
Beets, 681 bushels	68 10
Straw, 10 tons	80 00
Pasturage	592 00
Clover, green, 10 tons	15 00

Corn, fodder, 75 tons	$150 00	
Millet, 20 tons	20 00	
Turnips, 155 bushels	46 50	
		$3,521 60

Increase in value of herd	$1,773 00
Profits exclusive of home product feed used	7,073 67
Profits deducting value of home product feed used	3,552 07

PIGGERY PRODUCTS.

Bacon, 3,560 pounds	$538 28	
Ham, 10,845 pounds	1,588 45	
Pork, salt, 12,104 pounds	1,366 39	
Pork, fresh, 7,211 pounds	891 72	
Sausage, 1,101 pounds	120 84	
Lard, 1,769 pounds	208 00	
Pigs' feet, 762 pounds	22 86	
Manure, 200 loads	400 00	
Live stock on hand October 1, 1910	3,049 00	
		$7,985 54
Cost of Operation:		
Live stock on hand October 1, 1909	$3,124 00	
Feed:		
Bran, 11,200 pounds	136 86	
Corn, home product, 1,480 bushels	592 00	
Meal, 55,500 pounds	742 65	
Middlings, 57,797 pounds	816 71	
Salt, 52 bushels	13 80	
Salt, 3,570 pounds	15 05	
Salt Petre, 45 pounds	3 15	
Labor	378 00	
Fuel and repairs	25 00	
Bedding	75 00	
		5,922 22
Profits from operation		$2,063 32

HENNERY PRODUCTS.

Eggs, 800 dozens	$187 45	
Chickens, dressed, 365½ pounds	58 99	
Geese, 69 pounds	12 42	
Turkeys, 39 pounds	7 80	
Ducks, 42 pounds	7 56	
Manure, 5 loads	25 00	
Live stock on hand October 1, 1910	214 85	
		$513 07

COST OF OPERATION.

Live stock on hand October 1, 1909	$180 70	
Feed:		
Meal, 200 pounds	2 77	
Corn, 5,200 pounds	71 44	
Corn, home product, 150 bushels	60 00	
Labor	126 00	
Repairs	5 00	
		$445 91
Profits from operation		$67 16

INVENTORY OF LIVE STOCK ON HAND OCTOBER 1, 1910.

Colts, 4	$675 00
Horses, 23	3,460 00
	$4,135 00

DAIRY.

Bulls, 4	$185 00
Cows, 74	4,620 00
Calves, 20	245 00
Heifers, yearlings, 9	200 00
Heifers, two years old, 15	540 00
Steers, 1 pair, three years old	100 00
	$5,890 00

HENNERY.

Chickens, 196	$117 60
Hens, 89	66 75
Turkeys, 4	8 00
Geese, 3	4 50
Ducks, 20	15 00
Roosters, 4	3 00
	$214 85

PIGGERY.

Boars, 1	$25 00
Hogs, 44	1,320 00
Shoats, 57	684 00
Pigs, fall, 72	180 00
Pigs, spring, 24	240 00
Sows, breeding, 20	600 00
	$3,049 00

GEORGE TEAL,
Farmer.

REPORT OF GARDENER.

Garden, 25 acres.

Asparagus, 530 bunches	$53 00
Beans, dried, 2 bushels	4 50
Beans, lima, 13 13/32 bushels	13 41
Beans, string, 259 15/16 bushels	103 98
Beets, 598 9/16 bushels	237 20
Beets, 1,227 bunches	122 70
Brussel sprouts, 5 bushels	15 00
Cabbages, 38,876 heads	1,166 28
Carrots, 299 10/32 bushels	145 16
Carrots, 10 bunches	30
Cauliflower, 442 heads	26 52
Celery, 5,000 heads	100 00
Corn, green, 2,548⅓ dozen ears	254 82
Corn fodder, 15 tons	30 00
Cucumbers, 8,520	54 15
Lettuce, 3,119 heads	106 72
Muskmelons, 36	3 60
Onions, 402⅛ bushels	280 45
Onions, 1,447 bunches	28 94
Parsley, 3 bunches	09
Parsnips, 210 bunches	126 00
Peas, green, 186⅝ bushels	140 66
Peppers, 250	1 25
Potatoes, 32 bushels	8 00
Pumpkins, 1 ton	4 00
Pumpkins, 21	1 26
Radishes, 298 bunches	5 96
Sage, 56 bunches	2 80
Salsify, 8 bushels	8 00
Spinach, 22 bushels	17 50
Squash, summer, 472	10 24
Squash, winter, 2,000 pounds	40 00

Tomatoes, 128 3/32 bushels	$75 14
Turnips, 320⅛ bushels	94 92

PLANTS.

Blackberries, 70, 266 quarts	26 60
Currants, green, 364, 796 quarts	79 60
Gooseberries, 17, 41 quarts	4 10
Grapes, 100, 200 pounds	6 00
Raspberries, 553, 410 quarts	41 00
Rhubarb, 264, 2,772 pounds	27 72
Strawberries, 4,000, 478 quarts	47 80

Cost of operation:

Gardener	$516 00	
Labor of horses	60 00	
Seeds	80 70	
Fertilizer	60 12	
Fertilizer, home product	200 00	
Tools and repairs	10 00	
Plants, celery	3 00	
Plants, strawberry	9 00	
		938 82
Profits from operation		$2,576 55

FRANK SWAIN,
Gardener.

REPAIRS IN SHOE SHOP.

	Men.	Women.	Totals.	Value
Soles, new	2,939	166	3,105	$776 25
Heels, new	4,090	319	4,409	440 90
Repairs	3,114	593	3,707	370 70
Totals	10,143	1,078	11,221	$1,587 85

JACOB STROHL,
Shoemaker.

REPORT OF INDUSTRIES.

ANNUAL REPORT OF THE WORK DONE IN THE SEWING ROOM FOR THE YEAR ENDING SEPTEMBER 1910.

MANUFACTURED ARTICLES.

Aprons, barbers, muslin, 2	$0 40
Aprons, carpenter, ticking, 4	60
Aprons, kitchen, denim, girls, 156	117 00
Aprons, kitchen, drill, 118	41 30
Aprons, muslin, girls, 370	92 50
Aprons, waitress, muslin, 8	2 80
Aprons, rubber, 80	8 00
Articles, marked, 449	4 49
Bags, broom, 292	29 20
Bags, coffee, large, 29	2 90
Bags, coffee, small, 36	1 80
Bags, laundry, 48	48 00
Bags, rag, 4	2 00
Bags, stocking, 261	26 10
Bags, towel, 59	5 90
Belts, 29	2 90
Bibs, 173	17 30
Bibs for blouses, 3	45
Blankets, hemmed, 179	8 95
Caps, bakers, 12	1 20
Caps, duck, men's, 11	1 65
Caps, nurses, 164	24 60
Cases, pillow, 2,220	555 00
Chemise, 891	178 20
Cloth, dish, 22	1 10
Cloths, table, hemmed, 45	4 50
Cloths, tray, 22	2 20
Collars, women's, 77	1 54
Covers, corset, 17	4 25

Covers, dressers, 15	1 50
Covers, piano, 7	3 50
Covers, stock, 10	7 50
Covers, table, 3	75
Curtains, screen, 19	4 75
Curtains, transom, 23	2 30
Curtains, wardrobe, 34	34 00
Curtains, window, 391	195 50
Drapers, 441	44 10
Drawers, muslin, 434	110 25
Drawers, with waists, 192	57 60
Dresses, hickory, 302	453 00
Dresses, seersucker, large, 639	958 50
Dresses, seersucker, small, 236	177 00
Dresses, Sunday, 12	24 00
Frocks, denim, 56	28 00
Frocks, hickory, 73	36 50
Gowns, night, large, 346	173 00
Gowns, night, small, 76	19 00
Gowns, operating, 15	7 50
Hammocks, 6	9 00
Linings, bread baskets, 66	1 20
Mittens, canvas, 103 pairs	5 15
Napkins, hemmed, 178	17 80
Overalls, denim, 98 pairs	49 00
Overalls, hickory, 63 pairs	31 50
Pads, bed recovered, 48	24 00
Petticoats, muslin, 8	4 00
Petticoats, outing, 267	66 75
Petticoats, outing with waists, 142	42 60
Pillows, feather renovated, 5	1 25
Pillows, hair, renovated, 74	18 20
Sheets, double, 37	3 70
Sheets, rubber, 3	30
Sheets, single, 2,962	296 20
Shirts, domet, 27	13 50
Shirts, hickory, 1,148	574 00
Shirts, madras, 85	63 85
Shirts, muslin, 66	33 00

Shrouds, men's, 15	7 50
Shrouds, women's, 30	22 50
Slippers, khaki, 309 pairs	30 90
Strainers, milk, 10	1 00
Straps, curtains, 190	1 90
Straps, polisher, 390 yards	7 80
Suit base ball, 1	1 00
Suit, union, 205	205 00
Suspenders, denim, 847 pairs	84 70
String, bib and apron, 984 yards	9 84
Towels, bath, 3,834	575 00
Towels, sanitary, 2,124	106 10
Towels, roller, 12	4 80
Trousers, duck, bib, boy's, 190 pairs	47 50
Trousers, denim, bib, boy's, 90 pairs	22 50
Trousers, gray, men's, 54 pairs	51 00
Trousers, duck, men's, 21	21 00
Trousers, wool, boy's, 4	2 00
Vests, under, large, 240	60 00
Vests, under, small, 186	55 80
Waists, hickory, 422	211 00
	$6,289 02

REPAIRED ARTICLES.

Aprons, 265	$26 50
Blankets, 376	37 60
Bags, broom, 2	10 00
Bags, laundry, 136	40 80
Blouses, men's, 96	13 40
Cases, 80	4 00
Counterpanes, 73	7 30
Cloths, table, 26	6 50
Coats, 149	14 90
Coats, new, collar, 1	25
Drawers, under, 58	5 80
Flag, 3	1 75
Hammocks, 5	1 00

Linings, bread baskets, 6	90
Overalls, 63	9 45
Rugs, bound, 58	5 80
Sheets, 272	27 20
Shirts, 671	67 10
Shades, window, 45	6 75
Sleeves, shortened, 16	1 30
Suits, union, 19	4 75
Trousers, 1,802	180 20
Trousers, shortened, 136	13 60
Waists, 23	3 45
Waists, made over and new belts, 207	41 40
Wrappers, under, 63	9 45
	$531 25

MARIANNE BAYNE,
Matron.

ANNUAL REPORT OF WORK DONE IN SCHOOL DEPARTMENT DURING YEAR ENDING OCTOBER 1, 1910.

Initial letters outlined on:

Aprons, bags, curtains, dust cloths, dish cloths, gowns, napkins, pillow cases, sheets, spreads, skirts, table cloths, etc	40,715

Articles made:

Aprons	12
Buttons (sewed on garments)	348
Bags (work)	1
Cloths (lunch)	6
Cloths (dish)	9
Curtains	24
Dusters	51
Holders	12

Handkerchiefs	811
Napkins	16
Neckties	48
Sheets	105
Towels	914
Fancy work:	
Doileys (22-inch English eyelet)	1
Doileys (plain button-holed edge)	14
Doileys (hemstitched)	2
Handkerchiefs (hemstitched)	4
Lunch cloths (drawn work, Mexican)	2
Lunch cloths (hemstitched)	2
Wash cloths (knitted)	12
Wash cloths (linen, fancy stitched)	7
Shawl (knitted, white and yellow Shetland)	1
Shawl (knitted, red Shetland)	1
Pin rolls	4
Pin balls	8
Iron holders	20
Slippers (crocheted), pairs	4
Work bags (silk)	4
Handkerchief bags	6
Pyrography pieces	50
Number of pieces ironed in training class in laundry	40,812
Number of chairs caned in training class	200
Number of girls in training daily	148
Number of boys in training daily	300

Respectfully submitted,
MARY I. DOUGLASS,
Head Teacher.

NOTE: Our burnt wood pieces included boxes, plaques, tie racks, card cases, several holders, picture frames, etc.

STATISTICAL TABLES.

TABLE NO. 1.

STATEMENT OF PROPERTY.

(*Date of opening of institution, May* 1, 1894.)

Real estate:

Number of acres of land	543½	$41,960 00
Number of acres under cultivation, farm	259½	
Number of acres under cultivation, garden	22	
Number of acres under pasturage	170	
Number of acres in waste land	20	
Number of acres in wood land	20	
Number of acres occupied by buildings and in lawns	52	
Number of buildings	32	890,221 46
Total value of real estate		$932,181 46

Personal property:

Furniture	$51,625 72
Farm stock and implements	18,169 83
Farm produce	8,017 19
General supplies	6,247 76
Miscellaneous articles	9,855 91
Total value of personal property	$93,916 41
Total valuation	$1,026,097 87

TABLE No. 2.

MOVEMENT OF POPULATION.

	Male, 21.	Female, 21.	Male, 16–21.	Female, 16–21.	Male, 2–16.	Female, 2–16.	Total.
Total in Asylum October 1, 1909	355	144	241	61	173	67	1,041
Admitted during year	29	12	23	5	48	33	150
Total number in custody during year	384	156	264	66	221	100	1,191
Discharged during year	10	0	7	3	8	2	30
Died during year	22	8	6	6	5	4	51
Whole number discharged during year	32	8	13	9	13	6	81
Remaining October 1, 1910	352	148	251	57	208	94	1,110
Capacity of Asylum:							
Males	....	....	....	....	....	....	750
Females	....	....	....	....	....	....	250
Total	....	....	....	....	....	....	1,000
Daily average population	....	....	....	....	....	....	1,063,62

TABLE No. 3.

RESIDENCE BY COUNTIES OF THOSE ADMITTED, DISCHARGED AND DIED DURING THE YEAR, ALSO THOSE REMAINING OCTOBER 1, 1910.

COUNTIES.	Number Present October 1, 1909.		Received During Year.		Discharged During Year.		Died During Year.		Number Present October 1, 1910.		
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Total.
Albany	23	7	6	......	......	1	1	1	28	5	33
Allegany	3	4	2	1	......	1	......	......	5	4	9
Broome	4	5	1	4	......	......	......	......	5	9	14
Cattaraugus	7	2	3	1	......	......	......	......	10	3	13
Cayuga	5	3	3	1	......	......	1	......	7	4	11
Chautauqua	11	3	......	......	1	......	......	......	10	3	13
Chemung	5	3	......	......	......	......	1	......	4	3	7
Chenango	6	......	......	2	......	......	......	......	6	2	8
Clinton	6	3	1	......	......	......	......	......	7	3	10
Columbia	8	3	......	......	......	......	......	......	8	3	11
Cortland	1	1	......	......	......	......	......	......	1	1	2
Delaware	8	3	......	......	......	......	2	......	6	3	9
Dutchess	15	......	6	3	......	......	2	......	19	3	22
Erie	52	16	14	6	2	1	2	2	62	19	81
Essex	6	1	1	......	......	......	......	......	7	1	8
Franklin	6	2	......	......	......	......	......	......	6	2	8
Fulton	1	2	......	......	......	......	......	......	1	2	3
Genesee	2	......	1	1	......	......	......	......	3	1	4
Greene	3	......	......	......	......	......	1	......	2	......	2
Hamilton	1	......	......	......	......	......	......	1	......	......	1
Herkimer	3	2	1	1	1	......	......	1	3	2	5
Jefferson	15	4	1	2	......	......	1	......	15	6	21
Kings	77	12	1	1	3	......	1	......	74	13	87
Lewis	3	3	......	1	......	......	1	1	2	3	5
Livingston	8	......	1	......	......	......	1	......	8	......	8
Madison	4	2	2	......	......	......	......	......	6	2	8
Monroe	22	9	5	......	2	......	1	1	24	8	32
Montgomery	6	1	3	1	......	......	......	......	9	2	11
Nassau	5	1	1	......	1	......	1	......	4	1	5
New York	202	85	2	......	5	......	4	8	195	77	272
Niagara	7	3	1	......	......	......	......	......	8	3	11

TABLE No. 3 — (*Concluded*).

COUNTIES.	Number Present October 1, 1909.		Received During Year.		Discharged During Year.		Died During Year.		Number Present October 1, 1910.		
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Total.
Oneida	21	3	5	6	2	......	2	......	22	9	31
Onondaga	30	7	3	2	2	......	1	1	30	8	38
Ontario	6	1	1	......	......	......	......	......	7	1	8
Orange	14	5	6	3	......	......	......	......	20	8	28
Orleans	1	2	......	......	......	1	......	......	1	1	2
Oswego	8	6	1	1	......	......	......	......	9	7	16
Otsego	6	1	1	1	......	......	......	......	7	2	9
Putnam	4	......	......	1	......	......	1	......	3	1	4
Queens	5	3	......	......	......	......	......	......	5	3	8
Rensselaer	10	14	2	1	1	......	1	......	10	15	25
Richmond	3	......	1	......	......	......	......	......	4	......	4
Rockland	5	2	1	......	......	......	......	......	6	2	8
St. Lawrence	16	3	2	1	1	......	......	......	17	4	21
Saratoga	4	6	4	1	1	......	......	......	7	7	14
Schenectady	10	1	1	......	......	......	......	......	11	1	12
Schoharie	5	4	1	......	......	......	1	1	5	3	8
Schuyler	3	1	......	......	......	......	1	......	2	1	3
Seneca	4	1	......	......	......	......	2	......	2	1	3
Steuben	9	3	......	......	1	......	1	1	7	2	9
Suffolk	7	5	2	......	......	......	......	......	9	5	14
Sullivan	4	2	2	1	......	......	......	1	6	2	8
Tioga	5	1	......	1	......	......	......	......	5	2	7
Tompkins	3	1	2	1	......	......	......	......	5	2	7
Ulster	9	5	2	1	......	......	1	......	10	6	16
Warren	3	1	1	1	......	......	......	......	4	2	6
Washington	6	2	......	1	......	1	......	......	6	2	8
Wayne	8	2	......	1	......	......	......	......	8	3	11
Westchester	22	7	6	......	2	......	1	......	25	7	32
Wyoming	7	......	......	1	......	......	......	......	7	1	8
Yates	2	......	......	......	......	......	......	......	2	......	2
State	4	3	......	......	......	......	1	......	3	3	6
Totals	769	272	100	50	25	5	33	18	811	299	1,110

TABLE No. 4.

NATIVITY OF THOSE ADMITTED.

	DURING YEAR.			SINCE MAY 1, 1894.		
	Men.	Women.	Total.	Men.	Women.	Total.
Austria	......	......	......	6	2	8
Canada	......	......	......	15	9	24
Denmark	......	......	......	2	......	2
England	......	......	......	9	8	17
Finland	......	......	......	1	1	2
France	......	......	......	8	3	11
Germany	1	3	4	35	21	56
Holland	......	......	......	3	1	4
Hungary	1	......	1	9	3	12
Ireland	......	......	......	30	24	54
Italy	2	......	2	22	4	26
Norway	......	......	......	1	1	2
Poland	......	......	......	5	5	10
Russia	......	1	1	21	10	31
Scotland	......	......	......	3	2	5
Sweden	......	......	......	4	......	4
Switzerland	......	......	......	1	......	1
United States	93	43	136	1,120	459	1,579
Venezuela	......	......	......	1	......	1
Wales	......	......	......	1	4	5
Roumania	......	......	......	2	......	2
Unascertained	3	3	6	111	55	166
	100	50	150	1,411	611	2,022

TABLE No. 5.

AGE AT TIME OF ADMISSION OF THOSE ADMITTED.

	DURING YEAR.			SINCE MAY 1, 1894.		
	Men.	Women.	Total.	Men.	Women.	Total.
From 1 to 5 years	7	1	8	24	20	44
From 5 to 10 years	22	19	41	110	57	167
From 10 to 15 years	15	12	27	212	78	290
From 15 to 20 years	26	5	31	414	94	508
From 20 to 25 years	12	5	17	235	84	319
From 25 to 30 years	5	3	8	115	63	178
From 30 to 40 years	10	2	12	141	59	200
From 40 to 50 years	3	3	6	80	91	171
From 50 to 60 years	......	......	......	52	41	93
From 60 to 70 years	......	......	......	22	19	41
From 70 to 80 years	......	......	......	6	4	10
From 80 to 85 years	......	......	......	......	1	1
	100	50	150	1,411	611	2,022

TABLE No. 6.

ASSIGNED CAUSES OF MENTAL DEFECT IN CASES ADMITTED.

	DURING YEAR.			SINCE MAY 1, 1894.		
	Men.	Women.	Total.	Men.	Women.	Total.
Alcoholism, parental	2	2	4	22	4	26
Asphyxia	......	......	......	1	......	1
Apoplexy	......	......	......	1	......	1
Arrested development	2	......	2	5	5	10
Chorea	......	......	......	1	......	1
Congenital	8	10	18	139	85	224
Consanguinity	......	......	......	19	3	22
Convulsions	......	3	3	24	14	38
Cretinism	......	......	......	4	3	7
Delayed circumcision	......	......	......	1	......	1
Diphtheria	......	......	......	3	......	3
Dissipation	......	......	......	......	1	1
Eclampsia	......	......	......	......	3	3
Epilepsy	......	......	......	18	9	27
Fall	6	......	6	25	11	36
Heredity	23	11	34	94	46	140
Hernia	......	......	......	1	......	1
Hydrocephalus	1	......	1	8	1	9
Ill health	2	3	5	22	12	34
Ill health, maternal	3	2	5	17	6	23
Injury	......	......	......	21	3	24
Insanity, maternal	1	1	2	3	1	4
Masturbation	4	......	4	23	......	23
Maternal impression	......	......	......	10	8	18
Measles	......	......	......	2	3	5
Meningitis	2	1	3	28	10	38
Menopause	......	......	......	......	1	1
Menstrual disorder	......	......	......	......	2	2
Nervousness	1	......	1	2	2	4
Organic brain disease	2	......	2	9	1	10
Overdosing with paregoric	......	......	......	3	1	4
Overwork	......	......	......	3	1	4
Paralysis	1	......	1	6	......	6
Physical infirmity	......	1	1	2	1	3
Protracted labor	2	......	2	10	......	10
Rickets	......	......	......	1	1	2
Scarlet fever	2	1	3	29	12	41
Scrofula	......	......	......	1	......	1
Syphillis, parental	......	......	......	3	3	6
Self abuse	......	......	......	4	......	4
Senility, parental	......	......	......	......	1	1
Severe fright	......	......	......	3	......	3
Severe illness	......	......	......	12	7	19
Sexual excess	......	......	......	......	1	1
Teething	......	......	......	1	1	2
Whooping cough	1	......	1	2	2	4
Traumatism	......	......	......	7	2	9
Unascertained	37	13	50	708	335	1,043
Variola	......	......	......	1	......	1
None	......	2	2	105	14	119
	100	50	150	1,406	616	2,022

TABLE No. 7.

CAUSES OF DEATH OF THOSE WHO HAVE DIED.

	DURING YEAR.			SINCE MAY 1, 1894.		
	Men.	Women.	Total.	Men.	Women.	Total.
Abscess	......	1	1	3	3	6
Abscess, retro-pharyngeal	......	......	......	1	2	3
Addison's disease	......	......	......	......	1	1
Appendicitis	......	......	......	2	1	3
Anaemia	......	......	......	1	1	2
Apoplexy	......	1	1	9	3	12
Atrophy, acute yellow	......	......	......	1	1	2
Atrophy, progressive, muscular	......	......	......	1	2	3
Bronchitis	......	......	......	1	2	3
Cancer of the stomach	......	......	......	......	2	2
Cancer	......	......	......	1	......	1
Convulsions	1	1	2	1	2	3
Chorea	......	......	......	......	1	1
Dementia, primary	......	......	......	......	1	1
Drowned	......	......	......	1	......	1
Emphysema	......	......	......	......	1	1
Encephalitis	......	......	......	1	1	2
Enteritis	2	......	2	18	4	22
Epilepsy	......	......	......	9	1	10
Exhaustion	......	1	1	9	6	15
Erysipelas	......	......	......	1	1	2
General paresis	......	......	......	2	1	3
Grippe	......	......	......	2	2	4
Haemoptysis	......	......	......	1	......	1
Heart disease	3	1	4	14	7	21
Hernia, strangulated	1	......	1	2	......	2
Impacted gall stones	......	......	......	......	1	1
Inanition	......	......	......	55	22	77
Inflammation of bowels	......	1	1	3	3	6
Intestinal obstruction	......	......	......	5	5	10
Kantotoin	......	......	......	1	......	1
Meningitis	......	......	......	2	1	3
Nephritis	......	......	......	4	3	7
Neuritis, disseminated	......	......	......	2	......	2
Organic brain disease	......	......	......	1	......	1
Paralysis	......	......	......	7	3	10
Paralysis, progressive	......	......	......	1	2	3
Pericarditis	......	......	......	5	3	8
Peritonitis	1	......	1	5	2	7
Peritonitis, septic	......	......	......	1	1	2
Pleurisy, septic	......	......	......	2	......	2
Pneumonia	8	4	12	29	27	56
Pulmonary oedema	......	......	......	2	2	4
Pyaemia	2	......	2	14	1	15
Rheumatism	......	......	......	1	1	2
Sclerosis, amyotrophic lateral	......	......	......	2	......	2
Sclerosis, multiple	......	......	......	1	......	1
Senility	......	......	......	4	4	8
Shock	......	......	......	4	......	4
Status catilepticus	......	......	......	1	......	1
Status epilepticus	......	1	1	7	3	10
Strangulation	......	......	......	6	1	7
Tuberculosis	11	6	17	134	65	199
Tumor	......	......	......	......	1	1
Typhoid	3	......	3	10	1	11
Typhoid malaria	......	......	......	2	......	2
Tetanus	......	......	......	1	......	1
Traumatism	1	1	2	2	1	3
	33	18	51	396	198	594

FOURTH REPORT

OF THE

New York Interstate Bridge Commission

TO THE

Legislature of the State of New York

SESSION OF 1911

TRANSMITTED TO THE LEGISLATURE JANUARY 27, 191

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

STATE OF NEW YORK

No. 18.

IN ASSEMBLY

JANUARY 27, 1911.

FOURTH REPORT

OF THE

NEW YORK INTERSTATE BRIDGE COMMISSION

TO

THE LEGISLATURE OF THE STATE OF NEW YORK.

To the Honorable the Legislature of the State of New York:

GENTLEMEN.— Pursuant to the provisions of chapter 319 of the Laws of 1907, as amended by chapter 218 of the Laws of 1908, as amended by chapter 457 of the Laws of 1909, the subscribers have the honor to present the following report:

In the second report of your Commission transmitted to the Legislature, March 8, 1909, it was pointed out that borings would have to be made to secure definite information concerning the rock formation and character of the river bottom at the different locations for an interstate bridge theretofore proposed by this Commission. By an act of the Legislature in that year, the appropriation of $5,000 made by the Legislature of 1907 was increased to $25,000. (Chapter 457, Laws of 1909). But the use of this fund for borings and general engineering expenses was limited to such a sum as the New Jersey Interstate Bridge Commission should contribute for a like purpose. The State of New Jersey in 1909 passed an act (New Jersey Laws, 1909, chapter 122) authorizing any county of the State to appropriate sums of money not exceeding $10,000 for the use of the New Jersey Interstate Bridge Commission and re-enacted the same provision last year. (New Jersey Laws, 1910, chapter 89.) During the year 1909, the New Jersey Commission, not having sufficient available funds to contribute to borings and general engineering expenses, no engineering work was undertaken, but that Commission coming into funds in 1910, made it possible for the Commissions in joint session to provide for the making of test borings.

Thereupon the Commissions acting jointly, duly advertised for proposals for estimates for making test borings at various sites along the Hudson river and such bids were opened on June 2, 1910. The Commissions, in their advertisements, reserved the right to reject all bids should they deem it in the public interest so to do. When it was ascertained that the work desired could be let at a figure lower than the lowest bid received under the advertisement, the Commissions rejected all bids and made the contract for borings with The Phoenix Construction Company of New York City upon more favorable terms than had been contained in any of the bids submitted. Under the supervision of the engineers of the two Commissions, test borings were made at about opposite West One Hundred and Seventy-ninth street and West One hundred and Tenth street, respectively, and the results are fully set forth in the report of the engineers, hereto annexed. (Appendix "A.")

The cost of a bridge at any crossing over the Hudson river, between New York city and New Jersey, is largely dependent on the length of span that can be used and the superstructure of a bridge spanning the river from pier head line to pier head line will cost approximately twice as much as a construction of two spans with a pier near the center of the river. The latter plan was the one favored by your Commission in the selection of the One Hundred and Seventy-ninth street and the One Hundred and Tenth street sites and it was hoped that hard bottom would be found for the support of a central pier. The results, however, have not borne out the expectations of your Commission. Our engineers obtained the results of borings made by private parties about opposite West Fifty-ninth street, West Sixty-third street, West Sixty-eighth street and West Seventy-first street, respectively. The borings at all these sites, together with those made by your Commission, prove that there is no satisfactory foundation for a bridge pier in the center of the Hudson river, but that hard bottom can be reached at each pier head line, and your Commission are therefore of the opinion that any bridge crossing the Hudson river should be in one span between pierhead lines. As there is a width of about 2,800 feet between the established pier head lines along the entire length where a bridge is contemplated, we are advised by our engineers that the construction of such a bridge will cost practically the same at any of the proposed sites. Of course, the damages to property will vary considerably at each of the sites, but your Commission are of the opinion that the structure should be located where it will best serve the convenience of the public, and we are, therefore, of the opinion that a bridge located in the West Fifty-seventh to West Fifty-ninth street district will best meet interstate traffic requirements. This opinion is unanimously concurred in by the New Jersey Commission.

It has been suggested to your Commission that in view of the large cost of a bridge involving a span of about 2,800 feet that it would be advisable to study a tunnel system for vehicular traffic. The original act creating your Commission (chapter 260 of the Laws of 1906) provided for the investigation of tunnel construction, but the Legislature of 1909 repealed that provision (chapter 457 of the Laws of 1909), after your Commission had pointed out the inadvisability of the use of tunnels for vehicular traffic.

As we have gone fully into the matter of tunnels we desire to set forth our reasons for favoring a bridge against any tunnel system.

In considering tunnels most people have in mind the tunnels now built for railroad transportation, which are giving satisfactory and efficient service, but it must be remembered that a tunnel for vehicular traffic is a very different proposition. The railway tunnel does not have to come to the surface, since the passengers descend to it by stairways and elevators, but vehicles must enter a tunnel by an incline, on which the grades should not exceed 3 per cent. if any heavy hauling is to be considered, and these inclined approaches make the total length of structure very much longer than the actual river tunnel.

The United States government requires a depth of 40 feet of water at the pier head lines of the Hudson river, and to allow the proper diameter of tunnel, with the requisite amount of material between the top of such tunnel and the river bed, would necessitate putting the river tunnel grade about 80 feet below high water. As the ground surface in the neighborhood where the approach to the tunnel would commence, is at an elevation of about 75 feet above high water, a total elevation of 155 feet must be overcome, which on a 3 per cent. grade would demand a distance of 5,200 feet from the pier head line, bringing the tunnel entrance in the neighborhood of Broadway. A considerable portion of this distance would have to be an open cut, which would interfere with travel in the intervening up and down town avenues.

At the New Jersey shore it would be impracticable to reach the surface in a direct line, unless a tunnel was carried through the Palisades, coming out in the Hackensack valley, but of course the tunnel could be turned north or south and thus brought to the surface at an elevation of about twenty feet above high water, thus making the New Jersey approach about 3,300 feet long. Such a tunnel would then have a total length of over two miles and even if the New York approach were also turned north or south, and thus shortened like the New Jersey approach, the length would be over a mile and three-quarters.

We do not believe that the suggestion of making access to the tunnel with elevators for the conveyance of vehicles would be practical, as horse drawn vehicles could not be safely and rapidly handled in this way.

The length of a tunnel would thus be greater than a bridge, as the tunnel would require a greater descent than the bridge would require ascent, so the approaches would be longer and the hauling would require more energy to overcome the greater change of elevation.

It is also to be borne in mind that the lowest part of a tunnel would be near the center, so that all drainage would have to be removed by pumping, necessitating a powerful plant, ready at all times to take care of a heavy rainfall, which might at any time rush in through the long open cuts at either end.

It would be practically impossible to keep so long a tunnel in such soft material absolutely water tight, and such leakage as takes place in railroad tunnels without serious inconvenience would be most detrimental to all kinds of vehicles.

The ventilation of such a tunnel would be very difficult, as it would be a more serious problem than for a railway tunnel where the trains practically fit the entire bore and thus change the air with each passage, whereas in a vehicular tunnel there would be exhaust gases and smoke from passing automobiles and the animal excretions which would make the air foul, and there would be no way of changing it except by an expensive artificial ventilating plant.

A tunnel would also require a considerable lighting plant.

Finally, not less than six tubes would, in our engineers' opinion, be required to match the capacity of a bridge having four lines of subway or trolley tracks and a driveway wide enough for four lines of vehicles, besides two sidewalks; and according to our engineers the cost of tunnels of equal capacity would be about the same as a bridge.

For the above reasons, as well as for the general reason that vehicular traffic in the open is in every way more desirable than in an artificially lighted, ventilated and drained tunnel, we are of the opinion that tunnels cannot from any point of view serve the purpose of a bridge.

Before making any estimate of the cost of a bridge in the vicinity of West Fifty-seventh—West Fifty-ninth streets, it will be necessary to make additional borings to those heretofore made by private parties, covering the approximate area of each of the main piers and each of the anchorages, as these piers, for a span of about 2,800 feet will necessarily cover a large area and a single boring does not give sufficient data on which to make designs and estimates of cost. After these borings are made, it will be necessary to make calculations and prepare preliminary drawings for this great structure, which will be longer than any bridge at present constructed and for which there is therefore no accurate data as to cost, so that designs will have to be made before such estimate of cost of construction can be given.

No appropriation was asked from the Legislature of 1910 and the only act passed by that Legislature, with respect to your Commission, merely provided that the Commission was to be officially designated as the "New York Interstate Bridge Commission." (Chapter 459, Laws of 1910.)

The total disbursements audited and certified to date since January 28, 1910, the date of the last report, amount to $7,850.52, so that the Commission has to its credit an unexpended balance to date of $10,551.83.

For making additional borings and for the preparation of plans for the determination of the cost of construction in the neighborhood of West Fifty-seventh–West Fifty-ninth streets, your Commission will require, in addition to the unexpended balance, an appropriation of $7,500.

The Commissioners are serving without compensation.

All of which is respectfully submitted.

Dated, New York, January 4, 1911.

E. W. BLOOMINGDALE
A. J. SHAMBERG
GEORGE R. DYER
KINGSLEY L. MARTIN

Note.— Owing to the absence of Commissioner McDougall Hawkes, who is in Europe, the foregoing report was not submitted to him.

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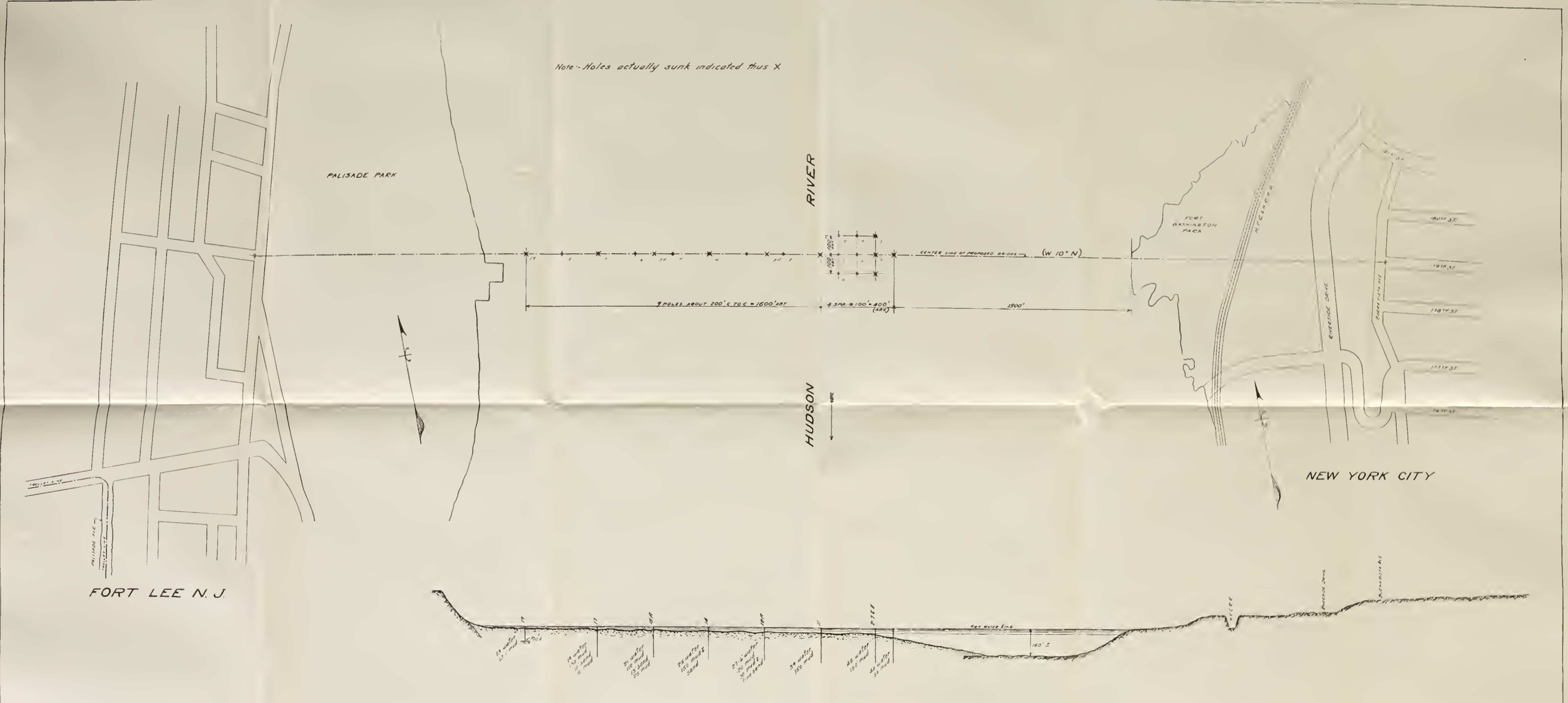

DIAGRAM
SHOWING POSITIONS FOR WASH BORINGS
NEW YORK & NEW JERSEY INTERSTATE BRIDGE COMMISSION
BOLLER & HODGE, CONSULTING ENGINEERS
SCALE 1 IN = 200 FT

PLATE I

APPENDIX "A."

NEW YORK, *December* 20, 1910.

To the Honorable New York Interstate Bridge Commission, No. 115 Broadway, New York City:

GENTLEMEN.— The operations of your engineering department during the past year have been as follows:

The funds at the disposal of the Commission have enabled your engineer to make a boring examination, seeking the engineering merits and possibilities of all proposed crossings of the Hudson river between Fifty-seventh street and One hundred and seventy-ninth street as controlled by foundation problems, and as to probable Federal requirements for span clearances. The cost of any crossing is largely dependent on the length of span that can be used, and the superstructure of a bridge spanning between pier head lines will cost approximately twice as much as two spans would cost, each of half the above length, but requiring a river pier. To the above end a series of borings were taken about One hundred and seventy-ninth street and One hundred and tenth street, which were suggested as possible economical crossings of the river, superadded to which there were obtainable several borings that were recorded in a report of the board of engineers made to the Secretary of War in 1894, between Fifty-ninth street and Seventy-first street.

The borings taken under your engineer's direction and supervision, were not carried deeper than 150 feet below river bottom, as that was deemed a limit for any practicable foundation scheme. The borings were made under contract with the Phoenix Construction Company. By reference to Plate I, it will be noticed that nineteen borings were laid out opposite One hundred and seventy-ninth street, nine of which were approximately on the site of a mid-stream pier, and the remainder in a continuous line to the New Jersey shore, mostly over water too shallow for deep navigation requirements, and it was thought possible to use comparatively short spans over this distance, in case satisfactory foundations could be secured. After making ten borings and finding no satisfactory bottom except near the New Jersey pier head line, where rock was found at a depth of about 80 feet from high water, it was deemed that further expense at this site was unnecessary, and the contractors were ordered to move their boring outfit to the proposed site about opposite One hundred and tenth street. By reference to Plate II, it will be seen that 18 borings were planned, 6 at each pier head line and 6 in the center of the river. After sinking 3 borings at the New York pier head line, the depth of rock was established at about 140 feet below high water. One hole on the New Jersey side brought up on rock at 97 feet below high water. None of the borings in mid-stream found any hard bottom within 150 feet below the river bottom.

On Plate III are shown the borings from the above cited engineer's report made by Mr. Charles B. Brush, for the New York & New Jersey Bridge Company, and on a line midway between Fifty-ninth street and Sixtieth street produced, which show no hard bottom outside the pier head line at less than 222 feet below high water, and this is doubtful, as some other borings were carried down to 296 feet.

The above borings conclusively prove that there are no practicable foundation conditions outside of the pier head lines, forcing the inevitable conclusion that any bridge contemplated over the Hudson river within the limits of the city of New York must have at least a single span over the river between the pier head lines. Inasmuch as the distance between pier head lines is substantially the same at any proposed crossing between Fifty-seventh street and One hundred and seventy-ninth street, the constructive cost of a bridge at any site will practically be the same. Such being the case, your engineer is of the opinion that the final determination of the bridge location should be guided by the line of greatest natural travel and public convenience. While the cost of real estate and abutting damages will vary according to location, still it is believed that the needs of the community served should be controlling within reasonable limits. All things considered, it is the firm opinion of your engineer that a bridge located in the neighborhood of Fifty-ninth street will best conform to the needs of population density and requirements on both sides of the river, and such location is recommended for adoption. Before proper planning of a bridge can be made, it will be necessary to take additional borings covering the approximate areas of each of the main piers and anchorages, as the piers and anchorages for the great span required will necessarily cover a large area, and the borings heretofore made are entirely too meagre to reach correct conclusions. After these borings are made it will be necessary to plan the foundations in conformity therewith, make careful calculations with preliminary drawings, for the structure required, having a span nearly twice as great as any suspension structure heretofore built, before any reliable estimate of cost can be made.

In view of the great cost at best for a bridge crossing under the conditions required, your engineer has given, at your request, consideration to the possibility of vehicular tunnels, suggested by the satisfactory and efficient service of the recently built railroad tunnels. A tunnel for vehicular traffic is entirely a different proposition from that of a railroad. A railroad tunnel does not have to come to the surface, since passengers can enter it by stairways and elevators, but vehicles must enter and emerge from a tunnel by inclines, on which a grade in excess of 3 per cent. is not desirable, if any heavy hauling is to be considered, and these inclines become very long, making a very extended structure, far in excess of what is required for simply crossing the river.

The Federal government requires a depth of forty feet of water at the pier head lines of the Hudson river, and to allow the proper diameter of tunnel to accommodate two lines of vehicular travel or one line of railway, with the requisite amount of material between the top of this tunnel and the bottom of the river, would necessitate putting the highway grade about 80 feet below high water. As the ground elevation in the neighborhood of Fifty-ninth street is at an elevation of about 80 feet above high water, a 3 per cent. grade would require about 5,300 feet to gain the surface of the ground in the neighborhood of Ninth avenue, involving a long, open cut and interfering with travel on the intervening up and down town avenues. These figures would be somewhat modified if it should be found practicable to found a surface tunnel in the Hudson river silt, as was done at Detroit, in a much stiffer river bottom. At the New Jersey shore it would be impracticable to reach the surface in a direct line, unless a tunnel was carried through the Palisades, opening out into the Hackensack valley.

A tunnel could be turned off after crossing the river, north or south, and come to the surface about 20 feet above high water, reducing the New Jersey approach to about 3,300 feet. The tunnel and approaches under the assumed grade would have a total length of over two miles. No consideration has been given to any elevator scheme at either end of the river tunnel, to avoid the long approaches, as it is not believed a practicable plan for handling a large vehicular traffic with reasonable rapidity.

The length of a tunnel would be greater than that of a bridge, as the tunnel would have greater elevations of descent and ascent to overcome. It must also be borne in mind that the lowest part of a tunnel would be near the center of the river, so that all drainage would require a pumping plant, ready at all times to take care of a heavy rainfall which might at any time rush through the long, open cuts at either end. It is doubtful if so long a tunnel in the soft material of the Hudson river bottom can be maintained absolutely water tight, and such leakage, while without serious inconvenience in a railroad tunnel, would be very detrimental (if only a dripping) to vehicular travel, especially to open automobiles. Again, the ventilation of the required tunnel would be most difficult, if not impracticable, as the volume of traffic does not substantially fill the tunnel bore, as in the case of railway trains, all electric, operating to drive the air in front of them and suck it in behind. In a vehicular tunnel there would be the exhaust gases and smoke from passing automobiles, and animal excretions would make the air foul, which would become intolerable unless it could be promptly removed. An extensive lighting plant would be required, much more than that for a bridge. As to cost, in the absence of detailed plans and estimates thereupon, in the opinion of your engineer, the cost of building tunnels compared with that of a bridge will not vary greatly, if at all, for traffic accommodation of similar capacity. A bridge would have a minimum trolley capacity of four lines of tracks, a driveway accommodating four lines of vehicles, and two sidewalks, which it is doubtful if six tunnel tubes could be made to equal, even omitting sidewalks, which would not attract travel in a long tunnel.

For the above reasons, as well as for the general reason that vehicular traffic in the light and air is much pleasanter and safer than in an artificially lighted, ventilated, and drained tunnel, under the best conditions, your engineer is of the opinion that tunnels are not adapted for a highway crossing of the Hudson river.

Respectfully submitted,
(Signed) HENRY W. HODGE,

Engineer of the New York Interstate Bridge Commission.

BOLLER & HODGE,
Consulting Engineers,
149 Broadway, N. Y.

SIXTH ANNUAL REPORT

OF THE

STATE WATER SUPPLY COMMISSION

OF

NEW YORK

For the Year Ending December 31, 1910

I. Municipal Water Supplies.

II. River Improvement for the Protection of the Public Health and Safety.

III. Water Storage and the Conservation of Water Power Resources.

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1911

STATE OF NEW YORK

No. 19.

IN ASSEMBLY

January 31, 1911.

SIXTH ANNUAL REPORT OF THE STATE WATER SUPPLY COMMISSION.

Albany, *January* 31, 1911.

Honorable Daniel D. Frisbie, Speaker of the Assembly:

Dear Sir: In compliance with the requirements of Article 2 of the State Boards and Commissions Law the State Water Supply Commission herewith transmits to the Legislature its report for the year ending December 31, 1910.

Very respectfully,
HENRY H. PERSONS,
JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

NEW YORK STATE WATER SUPPLY COMMISSION.

Henry H. Persons, *President*	East Aurora
John A. Sleicher	New York City
Milo M. Acker	Hornell
Charles Davis	Saugerties
Robert H. Fuller	Albany

David R. Cooper, *Secretary*	Albany

Walter McCulloh, *Consulting Engineer*	Niagara Falls

Office of the Commission: Lyon Block, Albany.

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SIXTH ANNUAL REPORT.

ALBANY, N. Y., *December* 31, 1910.

To the Legislature:

The State Water Supply Commission herewith submits its Sixth Annual Report in accordance with the provisions of Article 2 of the State Boards and Commissions Law and the amendments thereto.

With its report the Commission includes the results of the further studies made during the past year as reported to the Governor in accordance with the provisions of chapter 569 of the Laws of 1907, appropriation for the continuance of this work having been made by the last Legislature.

SCOPE OF THE REPORT.

For clearness in presentation, the report deals separately with the following subjects:

I. Municipal Water Supplies.
II. River Improvement for the Protection of the Public Health and Safety.
III. Water Storage and the Conservation of Water Power Resources.

Each of these subjects is closely related to the other two, and the best interests of the State require that each should be considered in connection with the others.

I.

MUNICIPAL WATER SUPPLIES.

The Commission, in its Fifth Annual Report, which was submitted to your honorable body under date of February 1, 1910, included water supply applications made in the month of January, 1910. It has been deemed advisable, for the sake of uniformity, to confine the report to the calendar year. Accordingly, the present report includes all the applications made to the Commission during the year 1910 by municipalities, private water companies and individuals in accordance with the law, for permission to acquire new sources of water supply. During the year the Commission has received twenty-four applications under the statute. Four made in 1909 awaited decision. The Commission granted twenty-three applications and refused its consent to one, for the reasons set forth in its decisions; two were discontinued. The applications made during the year represent a total investment of $850,000, and contemplate a total water supply amounting to 9,000,000 gallons per day for the use of a population of 100,000 in various municipalities.

The number of petitions for permission to acquire new or additional sources of water supply made to the Commission during the past year exceeds that of any previous year by nearly two-thirds.

The most important application considered by the Commission was that of the City of New York for permission to complete its plan for obtaining a water supply from the Catskills by the construction of a distributing system in the city extending to all its boroughs. The application was in form a modification of the plans approved by the Commission on May 14, 1906. The original application contained a tentative plan for the distribution of the Catskill water in New York city by means of an aqueduct carried through the borough of The Bronx and under the East river to the boroughs of Queens and Brooklyn. It was understood, however, when the original application was granted that this plan would be modified when there had been opportunity for more thorough surveys and investigations.

The application for the modification of the plans with respect to the distributing system was dated November 15, 1909, but owing to the change of administration in New York city and the desire of the incoming city officials to examine the plans before they were finally passed upon, action upon them was delayed at the request of the city. The plan as presented to the Commission originated with the board of water supply of the City of New York, and had the approval of the board of estimate and apportionment after a hearing had been given upon due notice. It contemplates the construction of a rock pressure tunnel from the Hill View reservoir at the northern boundary of the city. This tunnel will pass under the borough of The Bronx, the Harlem river, the borough of Manhattan for nearly its entire length, and the East river to the borough of Brooklyn. At its terminus the water will be delivered into surface mains, extending in one direction into the borough of Queens and in the other direction under the Narrows to the borough of Richmond, where a reservoir will be built to receive it. The rock pressure tunnel, which will be driven through solid rock at a depth of from two hundred to six hundred feet below the surface, will be capable of delivering the entire five hundred million gallons a day, or the maximum supply which the Catskill source is capable of furnishing. Its cost is estimated at $25,000,000, and four or five years will be required to complete it. The deep tunnel will be about seventeen miles long and the pipe line extensions will increase the total length of the distribution system to thirty-three miles.

In the borough of Manhattan vertical shafts at suitable distances will bring the water to the surface distributing system at any point where it may be required.

The advantages of the plan, as urged upon the Commission by the city, are that it will provide means for delivering the entire Catskill supply to the five boroughs of the city, thereby unifying the city's distributing system. The pressure at which the water will be delivered will, with few exceptions, render pumping within the city limits unnecessary. After a careful study of the project and a full hearing of those opposed to the application, the Commission gave its approval. The plans for a new water supply for the City of New York, an engineering project second only to the construction of the Panama canal, have thus been brought to completion. While it is possible that minor modifications may be found necessary from time to time as the work progresses, the Commission feels that the plan, in its broad outlines, is practicable and adequate.

WATER FAMINE IN WESTCHESTER.

By section 6 of chapter 723 of the Laws of 1905 the Commission was directed to report upon the advisability of the construction of a State system of water supply. In its First Annual Report the Commission gave the results of its investigation of this subject, and while it found that the construction of a State system of water supply would be inadvisable at that time, it pointed out the fact that certain areas of the State contain groups of municipalities with a population of such density that an ultimate source of water supply outside their limits seemed inevitable. The first of these groups, in point of density of population, consisted of the counties included within the City of New York. The second was the county of Westchester. New York city has found an additional supply of water in the Catskills. Westchester county has hitherto depended almost entirely upon the restricted supply of water found available within its limits. This supply, however, failed during the summer of 1910, causing hardship and inconvenience and endangering the health of the community.

In accordance with a resolution adopted by the Commission early in October, 1910, providing for an investigation of the Westchester situation with a view of devising a plan of relief, the President of the Commission, with the Consulting Engineer and the Division Engineer, made an examination of conditions, which was followed by further inquiry by the Consulting Engineer. The situation is fully discussed in the Consulting Engineer's report to the Commission (p. 86). Its gravity demands the prompt adoption of remedia measures.

The investigation showed that many of the municipalities in the southern portion of the county are dependent upon New York city for an adequate supply of water when their own supply fails, the city allowing them to take a portion of the Croton supply at the high rate of $133.33 a million gallons, which is the rate charged to consumers in the city limits. If a shortage of water in the city should be threatened, the city could not be compelled to continue this supply.

Full development of sources of supply within the county would yield additional water; but these sources would be exhausted by the rapidly growing population in 1917 or 1918. Probably they would not be sufficient to maintain an adequate supply until a new supply could be obtained from outside the county.

It has not been possible to make a detailed study of sources of supply outside the county, but it appears that approximately 35,000,000 gallons a day may be obtained at an elevation which would make pumping unnecessary and of a quality that would probably eliminate the use of filtering plants. This, with full development of local supplies, would meet the demands until 1925.

Under the present law the Westchester municipalities have a right to take water from the Catskill aqueduct upon its completion. It has been suggested that they wait until that time comes, trusting meanwhile to New York city and the more complete development of local supplies. It has also been suggested that a supply of water may be obtained from the city sources by the simple expedient of immediate annexation. Under either of those plans the water supply would cost consumers probably at least double the cost of an independent supply obtained from Popolopen creek and some of the tributaries of Peekskill creek. The present cost of pumping and filtering Westchester supplies probably exceeds $42 per million gallons.

There has been some idea that the city might be compelled by a legislative act to supply Westchester with water at a low rate. Whether the city would consent to such a law may be doubted.

The Consulting Engineer urges that the Westchester municipalities, whose growth and development are seriously endangered by the water supply situation, take immediate and concerted action to secure temporary relief and adequate future supplies.

To this end it is suggested that a metropolitan water and sewer district be created, to include that part of the county which lies south of the towns of New Castle and North Castle, and that the residents of this proposed district decide at a special election whether to form such a district and seek an independent source of supply under the direction of the State Water Supply Commission, providing the money necessary for preliminary work and submitting the final plan to the voters for approval, or to wait for the completion of the Catskill aqueduct.

The Commission earnestly commends this suggestion to the consideration of the residents of the Westchester municipalities to which it relates. If adopted, application should be made without loss of time to the Legislature for the passage of a law to give it effect.

IMPROVEMENT OF THE LAW.

While new and additional sources of water supply involving the acquisition of land cannot legally be acquired by any person, corporation or municipality without the consent of the Commission, an additional supply of water may be obtained from a source already in use or one not involving the acquisition of lands without such consent. As a result an additional supply of water may be obtained from a source that is unfit, as, for instance, the Niagara river, or the entire supply of a source upon which several municipalities are dependent may be absorbed by one municipality to the disadvantage of the others. This could be prevented by a change in the law requiring the consent of the Commission to any increase in water supply. Such a change would also remove any doubt as to the meaning of the present statute. The contention has been made in some instances that a municipality or company taking water from a stream or lake, or from driven wells in a defined area, may take an additional supply from any point in such a stream, lake or area without application to the Commission.

Additional water supplies have been obtained from time to time, usually by private companies, without application to the Commission. When such instances are brought to the attention of the Commission, it should have authority to require information that will enable it to determine whether a particular case is one that should be submitted for approval. There is at present no compelling reason for seeking the approval of the Commission in cases which fall within its jurisdiction, unless it is proposed to condemn land or to issue bonds, which cannot be sold unless all the requirements of the law are complied with; but these reasons do not exist if land is to be obtained by private purchase and if the money to be used in the construction of the plant is not to be derived from a bond issue. In cases falling within the scope of the Commission's authority and in which the promoters neglect or refuse to submit to the procedure prescribed by the statute, the Attorney-General might be required upon the request of the Commission, accompanied by an appropriate statement of the facts, to take suitable steps to compel obedience to the law. It is obvious that unless the statute is universally and impartially enforced a portion of its beneficial effect will be lost.

In some of the smaller municipalities, owing to lack of competent advice or to other causes, difficulties have been encountered in the selection of the best available sources of water supply and in the preparation of proper plans. Occasionally appeal has been made to the Commission for its advice, either in the decision between alternate sources of supply or in regard to engineering questions, and such requests, whenever possible, have been granted.

While plans involving the acquisition of new and additional sources of water supply must be approved by the Commission before they can be executed, the authority of the Commission ceases when it has given its consent. Its jurisdiction should also extend over the period of construction, so as to insure the performance of the work in accordance with the plans filed. To this end the Commission should be empowered to call for reports upon the work, or any portion of it, at any time during its progress, to make inspections if necessary, and its formal consent should be required before any new plant is placed in operation.

Plans for the storage of water for water supply purposes must have the sanction of the Commission when a new source of supply is involved, but plans for water storage for water power purposes do not require sanction. It would seem reasonable to place in the Commission a limited jurisdiction over plans for the development of water powers. Instances have occurred in which water supplies taken from streams have been rendered unfit for use by the construction of power plants and industrial establishments upon the streams above the points from which the water supplies were taken. Danger to health, litigation and needless expense might be avoided by giving the Commission authority to forbid the execution of plans for the construction of water power plants, unless it is shown (1) that they do not involve the diversion of water that is needed for water supplies, and (2) that they will not result in the pollution of water used or required for water supplies.

To guard against disaster by the breaking of dams inadequately constructed, the plans for all water storage reservoirs above a specified capacity should be submitted to the Commission for its amendment or approval.

There is a strong sentiment in certain localities in the State in favor of the regulation of the service rendered by water supply companies and municipalities and the rates charged therefor. The fact that many of these companies are owned by non-residents of this State has perhaps tended to make them indifferent to complaints of consumers. Their service has sometimes been inexcusably inadequate and their rates unsatisfactory. Such companies are peculiarly in a position to take advantage of public necessity. It has been suggested that authority to hear complaints and remedy abuses in respect to private water companies be given to the Commission and that the statute follow in general the provisions of law giving similar authority to the Public Service Commissions with respect to railway, lighting, power, telephone and telegraph companies. It seems reasonable that there should be some tribunal with power in respect to private water supply companies and municipalities to redress actual grievances.

The question of the pollution of water supplies is, in the opinion of the Commission, one of the most important of all the public questions now awaiting disposition. The inadequate provisions of law relating to the matter are a disgrace to the State. That admitted centers for the spread of so deadly a disease as typhoid fever should be allowed to continue in existence seems incredible. Reference to this subject has frequently been made in previous reports, and while jurisdiction over it properly belongs to the State Department of Health, this Commission desires again to urge the strengthening of the law. The statistics of the Department of Health give the number of deaths from typhoid fever within the State for the ten years from 1900 to 1909, inclusive, as follows:

Year.	Number of Deaths.
1900	1,948
1901	1,741
1902	1,318
1903	1,665
1904	1,652
1905	1,554
1906	1,568
1907	1,673
1908	1,375
1909	1,309
	15,803

The percentage of deaths from the disease is about .10, so that the record indicates the number of cases as follows:

Year.	Number of Cases.
1900	19,480
1901	17,410
1902	13,180
1903	16,650
1904	16,520
1905	15,540
1906	15,680
1907	16,730
1908	13,750
1909	13,090
	158,030

The direct expense and the indirect economic loss caused by each case of typhoid fever has been placed in one of the municipalities of the State where the disease has been of frequent occurrence at $500. The annual average number of cases in the State as shown by the table given has been 15,803. At the rate of $500 for each case, this means an annual loss of $7,901,500, or a total loss for the ten years of $79,015,000. This makes no account of the loss resulting from deaths or of the suffering and sorrow entailed, practically all of which might be avoided by the adequate protection of water supplies.

The State, through its Department of Health, in case of an epidemic of the disease, or in case analysis discloses the presence of danger, may forbid the further use of a contaminated water supply. This step often leaves a community entirely without water, entailing hardship and inconvenience until a new supply is obtained. The prevalence of dangerous conditions is revealed in the frequent warnings issued by local health officers to "boil the water" before using it. Although the Department of Health can abolish a water supply, it cannot, under the law as it now stands, compel the discontinuance of the source of pollution. Forcible recommendation for the removal of the defects in the statute was made in the last annual message of the Governor, and a bill to carry out this recommendation was introduced and urgently pressed for passage. It was opposed by the representatives of districts containing small municipalities, which feared that they might be put to expense by being compelled to abolish breeding places for typhoid fever germs, and also by industrial establishments desirous of retaining the privilege of polluting water courses. In consequence of this opposition, the measure failed to receive legislative approval. That conditions dangerous to life should be permitted to continue indefinitely is preposterous. Sooner or later they will be abolished. The longer suitable amendment of the law is delayed, the more drastic the action finally taken will probably be and the greater certainly will be the expense of abolishing hot-beds of infection.

While the most important step to be taken in the matter of pollution is the increase in the powers of the Department of Health, much good might be accomplished along the line of prevention by empowering the State Water Supply Commission specifically to require the adoption of measures for the future protection of the source from which a new water supply is to be taken. The law now provides that a petition for a new or additional source of water supply shall be "accompanied by such proof as to the character and purity of the water supply proposed to be acquired as the State Water Supply Commission shall require," and the Commission's rules relating to water supply applications require the applicant, in all cases, to submit chemical and bacteriological analyses of the proposed new supply. But in making a decision upon an application the law requires the Commission to determine:

First, "Whether the plans proposed are justified by public necessity."

Second, "Whether such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply."

Third, "Whether said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans."

If the Commission answers these questions in the affirmative, it seems bound to grant the application regardless of any question as to future purity of the water. It is true that the Commission may approve plans with such modifications "as it may determine to be necessary to protect the water supply and the interests of the applicant or of the inhabitants of the territory supplied by it with water, or the water supply and interests of any other municipal corporation, or other civil division of the State, or the inhabitants thereof, or the water supply and interests of any other person or water works corporation, engaged in supplying water to any other municipal corporation or other civil division of the State or the inhabitants thereof; or to bring into co-operation all municipal corporations, or other civil divisions of the State which may be affected thereby."

Therefore, to the three questions, which the Commission is now required to answer, there should be added a fourth question as follows:

"Whether such plans make adequate provision for the future protection of the source of supply from contamination."

In the absence of this authority the Commission has endeavored to ensure the purity of water supplies by insisting upon the installation of suitable purification plants; but municipal officers cannot bind their successors by any such understandings, and in one important case, at least, a promise made to install a filtration plant was disregarded with disastrous results to the health of the municipality making the application.

While, in the opinion of the Commission in the light of experience, the law may be improved in the particulars that have been indicated, it has worked successfully and has undoubtedly been of great benefit to the people of the State. It has protected the various civil divisions from unwarrantable encroachment upon their water supplies, ensured adequate compensation for damages, made it possible for differences of opinion to be presented for impartial decision, facilitated the construction of water supply plants and largely prevented serious errors in plans.

The prolonged drought of last year placed a severe strain on uncertain sources of water supply and in many localities caused much inconvenience. Some idea of the nature of the questions relating to water supplies that were submitted to the Commission for its decision during the year will be found in Appendix A, which contains a statement of the applications made and the decisions thereon.

RECOMMENDATIONS.

The Commission makes the following recommendations in respect to water supplies:

(1) *That plans for obtaining additional water supplies, as well as additional sources of supply involving the acquisition of land should require approval.*

(2) *That more effective means be provided for compelling the submission of plans.*

(3) *That the jurisdiction of the Commission be extended so as to cover constructive work after plans have been approved and its consent be required before a new plant is used.*

(4) *That water storage plans for power purposes be required to be submitted for approval so far as the protection of water supply needs and the public safety may require.*

(5) *That authority to regulate the service rendered and the rates charged by water companies and municipalities be given to the Commission.*

(6) *That the Commission be required to decide whether water supply plans make adequate provision for the future protection of the source of supply from contamination.*

(7) *That the acquisition of private water companies by other private water companies, or by municipalities, or the consolidation of private water companies without the consent of the Commission be prohibited.*

(8) *That the consent of the Commission be required for the acquisition of sources of water supply in cases where the supply is to be used wholly or partly in another State.*

The use of water for water supply purposes is its highest use and to this all other uses must give way.

II.

RIVER IMPROVEMENT.

The work accomplished during the year under that portion of the law giving the Commission authority over river improvements has been important. The improvement of the channel of Canaseraga creek has been begun, the preliminary steps for hearings upon the request for the improvement of the Genesee river have been taken, thus bringing it to the stage where hearings may be given, and surveys are being made for the improvement of the Hudson river upon petitions filed. None of the localities, which have been accustomed to apply to the Legislature for special appropriations for the improvement of unruly streams, have made application to the Commission, although notices were sent by the Commission calling their attention to the opportunity offered by the law for making the needed improvements under the direction of the Commission at the expense of the locality.

The absence of a satisfactory general law providing for water storage for power purposes has led to attempts on the part of those desiring river regulation for the improvement of water powers to attain their object under the sections of the present law which relate to river improvement. While the law in its amended form is sufficiently comprehensive to make possible river improvement for the protection of the public health and safety, it does not on its face contemplate the construction of storage reservoirs for water power purposes. The efforts to make use of a law that was drawn specifically for one purpose in order to accomplish another purpose, in the opinion of the Commission, can lead only to confusion, misunderstanding and ultimate disappointment.

The law providing for river improvement was passed before the State Water Supply Commission was created. Chapter 734 of the Laws of 1904 provided that a Commission consisting of the State Engineer and Surveyor, the Attorney-General, the Superintendent of Public Works, the Forest, Fish and Game Commissioner and one Commissioner who should be a civil engineer appointed by the Governor, should constitute the River Improvement Commission. It was found that the plan of creating a Commission consisting of State officers, whose attention was already fully occupied with the duties of their several departments, was not satisfactory, and by chapter 723 of the Laws of 1905 the River Improvement Commission was abolished and its powers and duties devolved upon the State Water Supply Commission. The River Improvement Law, when the State Water Supply Commission endeavored to apply it, was found to be so defective in several particulars that it was unworkable. The tests made during the proceedings for the improvement of Canaseraga creek revealed the weak places and successive amendments have produced a workable statute when river improvement for the protection of the public health and safety is the object which is sought to be reached.

Canaseraga Creek.

At the date of the last report the proceedings in the Canaseraga creek improvement were well advanced. Subsequent hearings were held at the court house in Geneseo, February 9, at the village hall in Mount Morris, March 2, 29, April 8 and April 15, on which date the hearings with reference to fixing the boundary lines of the improvement district, were closed. On April 15 the Commission's final determination with reference to the fixing of the boundary lines of the improvement district was rendered and the original plans were declared to be the final plans.

The Commission advertised the sale of bonds in the sum of $200,000, bids were received by the State Comptroller and opened on July 1, and the bonds were sold to the Windsor Trust Company of New York city at 103.13 and accrued interest. The bonds were issued in registered form in denominations of $5,000 and were delivered to the purchaser on September 8, 1910, and the amount, $208,093.33, was deposited in the National Commercial Bank in Albany to the credit of the Canaseraga creek improvement fund. A detailed statement of the disbursements from this fund will be found in Appendix E.

On May 7, 1910, a petition for writ of certiorari was served by Charles W. Bingham, trustee, and others, the relator asking that no tax be levied for the improvement upon his lands, alleging that the proceedings of the Commission were unlawful and the plan of improvement illegal and also that his lands would not be benefited. The case was argued before Justice Sutherland in June. As it seemed impossible that any decision, even if adverse, could go further than the exclusion of the lands of the relator from the assessment district as defined by the Commission, the bonds were sold in July and a contract was let in September providing for the completion of the work on or before September 12, 1912. The contractor sublet portions of the contract and began construction work. At the date of this report no decision had been made.*

GENESEE RIVER.

The Commission has proceeded in accordance with the statute, with the preparation of preliminary plans, specifications, estimates, lists and statements required by law to be filed in the county clerk's offices in the several counties benefited by the proposed improvement of the Genesee river. These plans and other documents were filed in the offices of the clerks of Monroe, Livingston and Wyoming counties on the fifteenth and sixteenth days of December, 1910. The Commission set the date of February 2, 1911, for the first public hearing pursuant to the statute in connection with this petition.

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* In January, 1911, Justice Sutherland rendered a decision holding the proceedings for the improvement of Canaseraga creek to be illegal on the ground that the plan involved the drainage of swamp land. He did not decide whether the lands of the relator were properly included in the assessment district. An appeal has been taken from this decision.

The State has shown much interest in the preparation of plans for the improvement of the Genesee river. The matter was brought forward more than twenty years ago when the State Engineer made a survey and in 1890 proposed the construction of a dam at Mount Morris. The Legislature in 1893 and 1896 appropriated $20,000 for further surveys which resulted in the proposal to build the Portage storage reservoir. A bill was introduced in the Legislature in 1895 " providing for the construction of a dam on the Genesee river for purposes of the Erie canal, and for restoring to the owners of water power on the Genesee river the water diverted by the State for canal purposes," as follows:

> " Section 1. For the purpose of improving the supply of water to the Erie Canal, and of restoring to the owners of water power on the Genesee river, the water diverted by the State for canal purposes, the superintendent of public works is hereby authorized and directed to construct, or cause to be constructed a dam on the Genesee river on one of the sites designated in the report of the state engineer and surveyor to the legislature, dated December ————, eighteen hundred and ninety-three. Said dam shall be constructed one hundred and thirty feet in height above the present flow line of the river, according to plans and specifications which the state engineer and surveyor is hereby directed to prepare and furnish, and in which he shall define its precise location.
>
> " § 2. The sum of two hundred thousand dollars, or so much thereof as may be necessary, is hereby appropriated from any moneys in the treasury not otherwise appropriated, to be paid on the warrant of the comptroller to the state superintendent of public works for the purpose of constructing said dam as provided in this act."

This bill failed to become a law.

The River Improvement Commission made studies of the river and when the Water Supply Commission succeeded it, the application of Monroe county, under which proceedings to determine whether the plan of improvement shall be carried out have now been begun, was made and the machinery provided by the River Improvement act was set in motion. The Legislature in 1908 again indicated its interest in the project by advancing $25,000 for making the surveys, provided the project was declared to be of sufficient importance to warrant the interference of the State, and a further sum has been spent out of the various appropriations made to enable the Commission to prosecute surveys throughout the State of possible water power developments, among which the Genesee was necessarily included.

While the petition of the county of Monroe is based, in accordance with the statute, upon the allegation that the protection of the public health and safety requires the regulation of the flow of the river, it is evident that the main object sought is water storage for power purposes. This clearly appears from the arguments advanced during the hearings that have been given upon the petition, although much emphasis has been laid upon the incidental benefits to be derived from the project. It is to be noted in this connection that one of the arguments most strongly insisted upon during the hearings,— the relief of the city of Rochester through an increase of the flow of the river sufficient to dilute and carry off the sewage poured into the river within the city limits,— has been almost if not entirely destroyed by the plans which have been adopted by the city for the construction of a sewage disposal plant, if such plans are executed.

In its last annual report, in discussing the Genesee improvement, the Commission said:

"It (the Commission) does not believe, however, that this project should be carried out under the River Improvement law, involving as it does the development of power as the principal object."

The complications that may arise from the construction of a storage reservoir for the protection of the public health and safety, that is, for the abatement of floods, and its operation for water power purposes are well exemplified in the Genesee project. If the reservoir is to be operated for the prevention of floods, the water accumulated by any excess of flow should be released as soon as possible with safety so that the reservoir may be in a condition to receive and hold back the next flood that may come. If it is to be operated for the purpose of producing the greatest possible amount of power, the accumulation of water should be released gradually, with the object of supplementing the flow of the stream so that it may be sustained at a certain minimum. Unless this is done and the industries dependent upon water power can be assured of a satisfactory minimum flow, a storage reservoir is largely useless for power purposes.

Furthermore, it would be unjust to assess the cost of constructing a reservoir built for the storage of water for power purposes upon property which has no interest in the development of water power but is seeking merely protection from floods. It would be equally unjust to assess the owners of water power rights not suffering from floods for the cost of a reservoir built solely for flood control.

An effort has been made to escape from this dilemma in planning the Genesee improvement by providing for a reservoir with sufficient capacity to impound flood waters and at the same time to store a sufficient amount of water to equalize the flow of the river for the production of water power. This has been done so that the considerable sums required to complete surveys and the preparation of plans might not be wasted so far as water power conservation is concerned.

In dealing with the Genesee river and with other similar situations involving the storage of water for power purposes the Commission, acting under the restrictions of an inadequate statute, has endeavored, so far as it has had authority, to guard the interests of the State and minimize the expenditures for surveys and the preparation of plans. It must adhere, however, in the exercise of its authority to the limitations imposed by the statute.

In order that the situation upon the Genesee river may be understood, now that proceedings have actually been begun for its improvement, it is necessary briefly to describe the interests involved. The two companies most conspicuously mentioned in connection with water power rights are the Genesee River Company and the Rochester Railway and Light Company.

The powers conferred by the State upon the Genesee River Company are contained chiefly in section 6 of chapter 605 of the Laws of 1898 which reads as follows:

> " Said corporation is hereby authorized to construct a main dam or reservoir on the Genesee river for the purpose of improving the sanitary condition of the Genesee valley, of checking floods in the Genesee river by producing as far as practicable an equable flow therein, of supplying necessary water to the enlarged Erie canal, and of furnishing pure and wholesome water for municipal purposes. The said corporation shall construct and maintain said main reservoir or dam on the Genesee river at the site thereof near the village of Portageville, which is described in appendix seven to the annual report of the state engineer and surveyor for the fiscal year ending September thirtieth, eighteen hundred and ninety-six; and the said main dam or reservoir shall be constructed of masonry with the crest of its spillway at an elevation of one hundred and eighteen feet above the present ordinary water surface of the Genesee river at the site aforesaid. Said corporation shall have the right to utilize all the water power incidentally created by the construction of said main dam or reservoir, and for the purpose of such utilization said corporation may construct, maintain and operate in and upon the Genesee river and its tributaries within one mile of the mouth of each of such tributaries and along the line thereof, at any and all points below the location of the aforesaid main dam or reservoir, all necessary power dams, subsidiary reservoirs, sluices, gates, trunks, irrigation canals and distributaries, hydraulic power, raceways and all other necessary appliances for the purpose of utilizing the water and water power of the said river for the development of hydraulic and electrical power and for the purpose of making and transmitting compressed air and for other purposes. Said corporation shall have the right to construct, maintain and operate said power dams and subsidiary reservoirs and appliances upon the necessary lands upon acquiring by purchase title thereto or the right of way or other easements or interests in the same from the owners thereof, and the said cor-

poration may acquire by purchase the title to or other interest in and become the owner of any and all lands along the line of the said Genesee river or its tributaries within one mile of the mouth of each of such tributaries below the said main dam or reservoir which may become necessary or which shall be deemed advantageous or proper to said corporation for the purposes in this act mentioned. It shall also have the right to purchase, hold, lease, sell and convey lands, water rights or other property for the purposes of its business, and upon said lands to accumulate, store and conduct water from the said Genesee river and its tributaries within one mile of the mouth of each of such tributaries and to sell, lease, furnish, operate and supply the said water by conducting the same in such manner as may be most convenient, feasible or economical, and to sell, lease, furnish and dispose of the power developed or to be developed from the flow or storage of the said water for fire, light, sanitary, municipal, manufacturing, agricultural, power or other purposes, and shall also have the right, by such hydraulic, electrical, compressed air conductors or other devices as shall be permitted by the local authorities of any city, village or town of the state in or through which such conductors or other devices shall be constructed, operated and maintained, to conduct, convey and furnish such power to, through or in any village, town or city within the counties of Monroe, Orleans, Genesee, Wayne, Ontario, Livingston, Wyoming and Allegany, or any of them, and to acquire, operate and maintain all such machinery and other apparatus as shall be necessary or proper for the transmission of such power to or within the said counties or any of them. The said corporation shall also have the right, upon obtaining the consent therefor of the local authorities, to furnish pure and wholesome water to any village, city or town in any of said counties of Livingston, Wyoming and Monroe, upon such terms as may be agreed upon between the local authorities of such village, city or town and the board of directors. Said corporation shall also have power to erect upon lands owned by it, buildings for the purpose of dwellings, manufacturing or business purposes, and to sell or lease the same.

> It is the general intent and purpose of this section to grant unto said corporation power to maintain, construct and operate said main dam or reservoir upon the Genesee river near Portageville with said subsidiary reservoirs and power dams upon the Genesee river and any of its tributaries within one mile of the mouth of each of such tributaries below the site of the said main dam or reservoir, and to use the water of the said Genesee river and its tributaries for the generation of hydraulic and electrical power and for compressed air, together with the right to construct maintain and operate machinery, transmission lines and other apparatus for the purpose of generating and transmitting power by water, electricity or compressed air for power or other purposes, and to sell, lease and dispose of the said hydraulic and electrical power and compressed air so generated. But nothing contained in this act shall be construed as affecting or authorizing the taking or impairing of any private or municipal right in the natural flow of the Genesee river at any point below the said main dam or reservoir, or on any tributary below said main dam or reservoir, or any real or other property or interest therein below said dam or reservoir, except by agreement with or by consent of the owners of such rights, property or interests so affected, taken or impaired respectively."

The company was incorporated by the Legislature on April 29, 1898. Its capital stock was $3,000,000 and it was required to expend within five years 10 per cent. of its capital in construction, failing which, the law provided that "the said corporation shall be dissolved." The company did not meet the requirement of the Legislature as to expenditure and it did nothing to improve the river. In 1906, three years after the expiration of the limit of time within which the law required construction to be begun, the Legislature passed a bill extending this limit for another five years, or until July 1, 1911.

It is obvious that if the charter of the company should be deemed to be still effective, it would derive great benefits from the construction of the proposed storage reservoir and, therefore, should be assessed for a correspondingly large portion of the cost of construction. It is equally obvious that, if the charter is dead, the levy of such an assessment would be inappropriate and might lead to injurious delays in the execution of the work.

There are in Rochester thirty-three water power plants on the Genesee river with an installation of 26,000 horse power. These plants have steam auxiliary of 21,800 horse power valued at $1,250,000 and using coal at an annual expense of $150,000 to $200,000 in addition to an annual maintenance charge of $100,000.

An examination of the situation shows that the Rochester Railway and Light Company owns or controls far greater operating water power rights in the river than any other interest. In Rochester this company has a practical monopoly of the water power generated at the Middle and Lower Falls. At and above the Upper Falls there are three power races: The Johnson and Seymour race, Brown's race and the Carroll and Fitzhugh race. In each of these powers the interest of the Rochester Railway and Light Company is predominant. The company also owns water power sites on the river at York, Geneseo and above Mount Morris. The development at Mount Morris is controlled by the Genesee River Company, partly as owner and partly as lessee of other shares. These interests and the owners of the thirty thousand acres of farming land in the valley below Letchworth park will be immediate and direct beneficiaries of the storage project. In addition, important benefits will be conferred upon the community in general by the improvement of sanitary conditions and the prevention of dangerous and damaging floods, the destructive power of which has been manifested at frequent intervals, especially in the city of Rochester.

Fear has been expressed that the construction of the Portage dam may detract from the beauties of Letchworth park, the magnificent gift made to the State in 1907 by Mr. William Pryor Letchworth. Any bill passed by the Legislature to authorize the building of the dam should contain specific provision for maintaining the flow of the river through the park at a volume well above the present minimum flow during the daylight hours and well into the evening, that is to say, at all times when the park is likely to contain visitors. Such a provision, with the creation of a well-kept navigable lake fifteen miles long adjoining the park and under

State control, would enhance rather than decrease its attractiveness.

The estimated cost of the improvement is $4,588,000, and the annual maintenance charge, including the interest and sinking fund payments, is $295,000, the improvement bonds running for a period of fifty years with interest at 5 per cent. In accordance with the requirement of the statute under which the petitioners are proceeding, the Commission has apportioned the cost as follows:

Counties	.5 per cent.
Towns	1.5 per cent.
Cities	5.0 per cent.
Villages	.2 per cent.
Individual owners of property	92.8 per cent.

It is not by reason of the ownership or non-ownership of specific rights or of water power sites by the State that it is called upon to act in the matter of water power development. It is the exercise of a governmental function inherent in all the people of the State to do that which individuals cannot do. The value of the exercise of this authority, the power owners who urge action under the River Improvement Act and who suffer by reason of the irregular flow of power streams, say should come to them without their being compelled to contribute anything beyond the actual amount expended by the State, even though the benefits derived therefrom amount to several thousand dollars per year. The Commission has taken the position that the owners of property benefited should pay to the State the value of such benefits. Such is the clear meaning of the Fuller Act under which the Commission made its studies to determine the value of the water powers of the State.

The work on the Genesee has been done by the Commission under the River Improvement Act pursuant to petitions as provided therein. The constitutionality of this act is based upon the fact that the Commission is directed to say, before any work begins, that the danger to public health and safety is of sufficient importance to demand interference by the State.

The law directs the Commission " to prepare a statement or list of the counties, towns, cities, villages and individual properties which in its judgment will be benefited by reason of such improvements, together with a statement of the proportional share of said total cost which should be borne by said counties, towns, cities and villages respectively, and by the individual owners of the property benefited collectively expressed in decimals." This law also provides for a public hearing after which the Commission shall determine whether the statements, maps, plans, etc., should be modified. The Commission has made the tentative maps, plans, specifications, estimates and statements and fixed a day for a public hearing thereon. Upon this hearing it is expected that the rights of the several individuals, corporations, franchises and municipalities, and what portion of the expense such property and rights should pay toward the total cost of the storage dam on the Genesee will be discussed. After such hearing the Commission will determine whether the proposed improvement on the Genesee river shall be abandoned or proceeded with and what, if any, modification should be made in such plans, specifications, estimates and statements, and if it is determined that the improvement shall go forward, fix the portion of the total cost of such improvement the property and municipalities benefited should pay.

Since the improvement is entirely local in its nature, no part of the cost has been apportioned to the State. Upon the completion of the reservoir, however, the water power at the dam, owing to the location of Letchworth park, may be developed by the State and by the State alone, assuming that any dormant grants that may have been made have been repealed. The Commission in accordance with the Fuller Act, has prepared plans for the development of this water power by means of a tunnel. The cost of this work is estimated as follows:

Tunnel and power house	$2,282,000
Annual operating, interest and sinking fund charge	100,000
Annual gross revenue	300,000

These figures are based upon the sale of water power at the power house. If the State should go a step further and convert this power into electricity at an added cost of $1,065,000, its gross annual income therefrom would be not less than $700,000. This method of development, of course, would bring all the electrical power developments in the western part of the State into competition with the State.

Whatever may be the possibilities, however, there is no method under the law as it now stands permitting the State to take advantage of its opportunity at Portage, and, therefore, the Commission has felt that it would not be justified in apportioning to the State any part of the cost of the work.

Hudson River.

Petitions for the improvements of the Hudson river were filed with the River Improvement Commission in February and March of 1905. Subsequent to the investigations made under the Fuller Act, and on December 17, 1909, the following petitions for the regulation of the flow of the river for the protection of the public health and safety were received by the Commission and placed on file:

1. Petition of the city of Albany.

2. Petition of the town of Queensbury, county of Warren.

3. Petition of the employees of the West Virginia Pulp and Paper Company of Mechanicville, Saratoga county.

4. Petition of the residents and business men of the village of Mechanicville, Saratoga county.

5. Petition of the International Paper Company, Union Bag and Paper Company, Iroquois Pulp and Paper Company, West Virginia Pulp and Paper Company, Hudson River Power Company, Hudson Valley Railway Company and Finch-Pruyn Company.

Under the provisions of the Fuller Act, the Commission has continued its investigation of last year by making a complete power survey of the Hudson river from Troy to Hadley. This survey has included an accurate profile of the river and a detailed examination into the conditions affecting the development of water power at each of the numerous plants along the river.

The petitions for the improvement of the Hudson are intended to bring about the construction of the Sacandaga reservoir. This appears from a statement made by the attorney for several of the petitioners at an informal hearing on November 17, 1910, as follows:

> "So far as this petition is concerned, it refers to the so-called Sacandaga storage project and it is known the State over through the reports of this Commission and through published papers, and especially through a detailed reference to it in the message of the Governor last year, that the Sacandaga project presents a storage proposition of great public importance and an ideal one from the standpoint of hydraulic development."

The complete control of the Hudson river would involve the construction of a large number of reservoirs at its headwaters and upon its tributaries. Some of these reservoirs would occupy State land within the boundaries of the Adirondack park, and, therefore, cannot be built until the Constitution has been amended so as to permit the use of State land for this purpose. The surveys and plans which have been made by the Commission in this watershed under the Fuller Act during the last three years were made as the law directed for the purpose of obtaining information regarding the development of water power by the State and not for the purpose of devising means for flood prevention. Consequently, although the studies that have been made are useful so far as they go, they do not constitute a complete scheme of flood prevention.

The petitions now before the Commission, while in form they ask for complete flood prevention, in fact ask for flood prevention so far as it can be accomplished by the construction of a reservoir on the Sacandaga river. The measurements made indicate that the reservoir would mitigate the severity of the spring floods and that it would moderate decidedly the floods occurring at other seasons. It would be far from a complete prevention, but it is entitled to consideration on its merits as a partial measure for the protection of public health and safety. Surveys have shown that complete theoretical control of the flow of the Hudson would require water storage in a succession of reservoirs to the total amount of 120,000,000,000 cubic feet, of which only 60,000,000 cubic feet is practicable. While the proposed reservoir on the

Sacandaga river would have a capacity of only 29,000,000,000 cubic feet, nevertheless it is the largest single reservoir that can be built for Hudson storage. By increasing the flow of the Hudson in the dry season it would aid navigation.

The estimated cost of the Sacandaga reservoir was given in the Commission's last report as follows:

Construction	$4,650,000
Annual maintenance, interest, sinking fund and other charges	237,700

As the annual interest and sinking fund payments of $180,700 were based upon an interest rate of 3 per cent. for fifty-year bonds, it is probable that the total would be increased to some extent by the necessity of paying a higher rate.

Although the plans for the Sacandaga reservoir are practically complete, it will be necessary, before hearings can be given, to prepare a statement of the counties, towns, cities, villages and individual property owners which, in the opinion of the Commission, will be benefited thereby, and to make an apportionment to them of their proportional shares of the total cost of the work.

The State would derive no direct return from the Sacandaga reservoir under the present law. As in the case of the Genesee reservoir at Portage, the plans for the Sacandaga reservoir render possible an important water power development at the dam which would be owned and controlled by the State. By the construction of a rock tunnel two miles long the use of the water from the reservoir would yield 25,000 to 30,000 continuous horse power. It has been roughly estimated, as shown in the report of Mr. John R. Freeman, included in the Commission's report of 1908, that this development could be made and a power house and transmission lines built for $5,000,000, with annual charges amounting to $428,000. The sale of 25,000 horse power in the form of electrical energy at the rate of $25 per horse power per year would yield a present income of $625,000 and more in the future.

The dangerous and unsanitary conditions caused by Hudson river floods below the State dam at Troy are almost wholly due to ice jams in the river channel. Floods from this cause cannot be wholly prevented by any system of water storage. The execution of the plans of the federal government for improving the river channel between Troy and Coxsackie will doubtless improve conditions, and it is expected that good results will follow the action taken by the last Legislature in authorizing the Superintendent of Public Works to use tug boats to break up the ice jams.

OTHER PETITIONS.

When the duties of the River Improvement Commission were transferred to the State Water Supply Commission, there were several river improvement petitions pending before the River Improvement Commission. The petitions made to that Commission, which have not been moved before the State Water Supply Commission, and the disposition of each were as follows:

CHENANGO RIVER.

The petition of P. F. McGrath and fifteen other riparian owners for relief from flood conditions, which they stated were a menace to the public health and safety in Binghamton, was filed with the River Improvement Commission on January 24, 1905. It was referred to the Engineer Commissioner, who reported on March 30, 1905, that storage of the flood waters would apparently be too expensive, and he recommended the construction of a dike and some appurtenant structures as the most practicable plan for flood relief in Binghamton. Individuals having offerred to bear the major portion of the expense of making the surveys and plans, the Engineer Commissioner was authorized to prepare preliminary maps, plans and estimates, pursuant to the statute, at no expense to the State except his own salary and personal expenses. Plans were prepared and were adopted by the River Improvement Commission on January 10, 1906, on which date the River Improvement Commission also rendered its determination as to the apportionment of the assessments, deciding that the city of Binghamton, as such, should bear the entire expense of the proposed improvement. The preliminary maps, plans, etc., were subsequently filed in the county clerk's office in Broome county, and a public hearing was held on February 28, 1906, at the office of the Attorney-General in Albany. The River Improvement Commission then issued a final order for the execution of the improvement and transmitted it to the Legislature, which took no action.

WOODBURY CREEK.

The petition of various riparian owners of Woodbury creek, town of Woodbury, county of Nassau, was filed with the River Improvement Commission July 26, 1905. The Engineer Commissioner was directed to make a preliminary investigation, and he reported October 25, 1905, recommending the construction of a rock cutoff as the most practicable means of relieving the flood conditions. The Engineer Commissioner was accordingly directed to prepare the maps, plans and estimates required by statute, and on January 24, 1906, these maps and plans were adopted by the Commission; and the Commission's determination as to the apportionment of cost was also rendered, specifying that two-thirds of the cost should be borne by the town of Woodbury and one-third by the individual property owners benefited collectively. A public hearing was held at the office of the Attorney-General in Albany, March 7, 1906, after which the River Improvement Commission denied the petition on the ground that the conditions did not constitute a sufficient menace to the public health and safety to warrant the Commission in proceeding.

RAQUETTE RIVER.

At a meeting of the River Improvement Commission held on May 25, 1905, a petition was received from certain riparian owners on the Raquette river praying for relief from conditions said to constitute a menace to the public health and safety. The petition was referred to the Engineer Commissioner, who reported on July 26, 1905, calling attention to what he considered very favorable opportunities for the construction of storage reservoirs to accomplish the results desired by the petitioners. On that date the Engineer Commissioner was authorized to make suitable preliminary surveys and plans at no expense to the State except for the Engineer Commissioner's salary and personal expenses. He reported further on February 6, 1906, recommending the construction of four reservoirs, as follows:

1. With dam at the Oxbow, above Tupper lake. (Flooding of State lands involved.)
2. Dam at outlet of Round lake, flooding Round lake and Little Tupper lake. (No State lands involved.)
3. With dam at Moosehead, Stillwater. (No State lands involved.)
4. Holleywood, Stillwater. (No State lands involved.)

The petitioner having offered to pay the expense of the preparation of preliminary maps and plans, the Engineer Commissioner was directed on July 26, 1905, to prepare them. This work was in progress when the duties of the River Improvement Commission were transferred to the State Water Supply Commission and very soon thereafter the Engineer Commissioner died without having reported on the project.

SILVER CREEK.

The petition of the president of the village of Silver Creek, Chautauqua county, and various riparian owners on that creek was filed with the River Improvement Commission on February 23, 1905. On March 1, 1905, the Engineer Commissioner was directed to make preliminary investigations and report. He reported on March 30, 1905. The improvement was not further progressed owing to failure of the Legislature to make appropriation for the necessary surveys and investigations.

SARANAC RIVER.

The petitions of the towns of St. Armand, Franklin and Black Brook and certain riparian owners on Saranac river praying for relief from conditions which were said to be a menace to the public health and safety, arising from the irregularities of the flow of the Saranac river, were filed with the River Improvement Commission on September 28, 1905. The Commission held several public hearings, at which the petitions were opposed on the ground that the execution of the proposed improvements would result in flooding State land in the forest preserve in violation of the Constitution. Proceedings on this proposed improvement were, therefore, abandoned.

PAPER MILL BROOK.

A petition from certain riparian owners on Paper Mill brook, town of New Berlin, Chenango county, was filed with the River Improvement Commission on December 7, 1905. The matter was referred to the Engineer Commissioner, who reported January 24, 1906, that there was a condition of overflow. No further proceedings were taken.

RIVER IMPROVEMENT AT LOCAL EXPENSE.

Chapter 284 of the Laws of 1909 gave the Commission jurisdiction over the improvement of water courses at local expense. Under the provisions of this act the village of Tupper Lake filed a petition on July 19, 1909, for the construction of a low dam on the Raquette river at Setting Pole Rapids. The project was described in the Commission's last annual report. There have been no further developments during the year, the petitioners having so far failed to deposit the funds required by the statute for the execution of the work.

LOCAL LOSSES FROM FLOODS.

It has been the custom of communities suffering losses from floods to cause special appropriation bills for their relief to be introduced in the Legislature. A number of such bills were passed by the last Legislature and disapproved by the Governor on the ground that the river improvement statutes were intended to provide for such cases and that if the State was to take them up, petition should be made to the Water Supply Commission pursuant to the provisions of the statute.

The Commission, after the adjournment of the Legislature, communicated with the local officers or the legislative representatives of the communities on behalf of which bills had been introduced asking for appropriations, as follows:

> "It has been brought to the attention of the State Water Supply Commission that the people of your community desire the improvement of the ——————— river by the construction of a dike for the protection of adjacent property. Several measures appropriating public money for the im-

provement of various streams were passed by the last legislature and vetoed by the Governor, who in explanation of his disapproval said:

"It does not satisfactorily appear that there is any obligation on the part of the State to make these improvements. If either of the cases fall within the river improvement act, proceeding may be taken under its provisions.

"The river improvement act to which the Governor referred was included in the Consolidated Laws and constitutes a portion of Article 2 of the State Boards and Commissions law, which defines the powers and duties of the State Water Supply Commission. The article referred to is reproduced in Appendix 'C' of the Fifth Annual Report of the Commission, a copy of which is being sent to you under separate cover. This report also contains the information necessary for the preparation of a petition for river improvement.

"The Commission has thought it proper to advise you that it is ready at any time to consider a petition in accordance with the provisions of the statute for a proceeding to bring about the improvement desired by your community and to determine what portion, if any, of the expense may properly be borne by the State.

"The Commission will be glad to furnish any additional information that may be required."

Only one reply was received, namely from the commissioner of public works of the city of Utica, who stated that the improvement contemplated was not considered of sufficient importance to the city of Utica to warrant its officials filing a petition.

AMENDMENT OF THE LAW.

During the progress of proceedings last summer for the improvement of Canaseraga creek it was found that a portion of an amendment of the River Improvement Law made by chapter 354 of the Laws of 1907, had been omitted in the consolidation of the law in 1909. This amendment affected section 12 of the State Boards and Commissions Law. The secretary of the Board of

Statutory Consolidation informed the Commission that the board had intended to include the omitted portion of the section and that his examination of the records of the board led him to believe that the omission was due to an error of the printer. The omitted amendment, which should have been added at the end of section 12 of chapter 56 of the Laws of 1909, which relates to proceedings upon approval of a petition for river improvement, reads as follows:

> "The Commission shall have power to make such minor changes in the said final map, plans and order as the nature of work may require, provided that such changes shall not add to exceed ten per centum to the cost of executing the plans embraced in such final order as approved by such act of the legislature; and provided, further, that if any such minor changes shall add more than ten per centum to the cost of any such improvement, a final order for which has been approved by an act of the legislature, the commission shall publish such fact, and shall give a hearing thereon as in the first instance with special reference to such increased cost of improvement, and shall await thereafter a further and final approval by subsequent act of the legislature."

In the judgment of the Commission the inclusion of this amendment is important to the effective accomplishment of river improvement work and the Commission recommends that it be restored to the law in its proper place.

The Commission, therefore, recommends in relation to river improvement:

(1) *That the law be amended by restoring the portion inadvertently omitted during the consolidation.*

(2) *That where water power development is, in the judgment of the Commission, the principal object of an application for river improvement, authority be given to the Commission to reject the application for that reason.*

III.

WATER STORAGE AND THE CONSERVATION OF WATER POWER RESOURCES.

Surveys and investigations resulting in the accumulation of data of great value to the conservation and development of the water power resources of the State have been made during the year under the direction of the Commission by its engineering staff. This work has been directed mainly toward the completion of plans for water storage upon rivers where important industries already established have suffered heavy losses from the failure of power due to preventable fluctuations of stream flow. It has carried forward the studies of the following rivers:

The Black river and its tributaries, upon which the 78,890 intermittent water horse power now in use is capable of being greatly increased;

The Oswego-Seneca river and its tributaries, including the Finger lakes, where the 34,345 intermittent water horse power now used is capable of being largely augmented;

The Hudson river, from Troy to Hadley, with 135,447 intermittent horse power in use;

The Genesee river, with 18,063 intermittent horse power in use.

In addition, the work of stream gaging has been continued and extended in co-operation with the United States Geological Survey, the rainfall observations have been extended and maintained and studies of evaporation have been made. This material will be extremely useful in connection with water power development plans, whether public or private.

The detailed results of these studies are described and discussed in the report of Walter McCulloh, Consulting Engineer.

A new branch of work was undertaken in the investigation of small water powers for farm and country home use. The results of this investigation are set forth in the report of David R. Cooper, Engineer-Secretary, submitted herewith.

POLICY OF THE STATE.

The policy of the State with regard to the conservation and development of its water powers has been of gradual growth, although each step has led in the same general direction. An account of various investigations made will be found in the report of the Consulting Engineer for the year 1908.

Following an agitation of more than ten years, during which the increasing importance of the water powers of the State constantly obtained greater recognition, the Legislature in 1902 created the Water Storage Commission, consisting of five citizens appointed by the Governor to act with the Attorney-General, the State Engineer and Surveyor, the Superintendent of Public Works and the Forest, Fish and Game Commissioner, to investigate the causes of floods and to make recommendations for their prevention. This Commission found that the loss from floods in the State during 1902 had exceeded $3,000,000. Its studies of the various streams led it to call attention forcibly to the extremely valuable possibilties of water power development, and in the report which it made to the Legislature in 1903 it said:

> "We believe that state supervision and control is the only safe method of intelligently initiating, constructing and maintaining an adequate system of river improvement in this state. Such state supervision and control, by a commission of recognized competence and character, would not only secure the scientific treatment of such stream as a whole, but the safe and economical execution of the various component parts of a comprehensive system of river improvement in the order of their relative urgency and importance. Legislation providing for such a system of river regulation is in our opinion a great and urgent public necessity."

The Commission further recommended that the work of river improvement should be entrusted to a permanent commission and that its cost should be borne entirely by the property benefited.

This recommendation was adopted by the Legislature, which thereby committed the State to the policy of State control. In 1907 the Legislature took a further step by establishing the principle that new grants of water power rights should be made only upon the basis of an annual payment to the State for the privilege granted, the amount of such payments to be readjusted at specified terms. Upon these conditions authority was granted to a corporation to use water power in the St. Lawrence river for the operation of an electrical power plant on the Long Sault rapids.

Still another and more important step was taken by the Legislature of 1907 by the passage of the law commonly known as the "Fuller Act" (Chapter 569 of the Laws of 1907). This act directed the State Water Supply Commission to collect information relating to the water powers of the State, devise a general plan for their progressive development and to report a draft of a referendum bill for a general law to carry its recommendations into effect. In the preparation of its plans, the Commission was directed, in case the construction of a dam upon any water course was included, to "estimate the water horse power which would be developed at such proposed dam, the probability of selling such water power, and the probable gross and net revenues from both direct and indirect sources which would be derived from the sale of such power at such proposed dam." In the preparation of the bill which the Commission was directed to draft in order to carry out its recommendations, it was required to include a financial plan providing for the issue of State bonds to pay the cost of water power development and for an annual tax sufficient to pay the interest and sinking fund charges thereon. The bill also provided that "the rate of charge for the use of the water horse power under contract for sale shall be based upon the aggregate cost of the development * * * and such rate of charge shall be so adjusted that it will produce a net revenue sufficient to pay, in addition to all costs of superintendence, maintenance and depreciation, the interest upon the bonds as the same shall become due and the principal of said bonds at their maturity."

Thus at the beginning of 1908 the Legislature had outlined a State policy with regard to water powers, the principal points of which included State control, the payment of compensation for new grants, the storage of water by the State at public expense and the sale or lease of the right to use the water so stored upon terms which would reimburse the State for its outlay, and the progressive development by this method of all streams capable of yielding additional water power.

In pursuance of the policy outlined in the Fuller Act, the State has expended upward of $100,000 in ascertaining the extent and value of its undeveloped water power resources and in making the detailed surveys and estimates required by the act.

In recommending the subject to the last Legislature, the Governor in his annual message expressed the opinion that the following principles should be accepted:

> "(1) That the flow of water in our rivers should be regulated and our water powers developed to the fullest extent that may be practicable. This is essential to prevent unnecessary damage from floods and to ensure our industrial progress and the future prosperity of our people.
>
> "(2) That with respect to streams having their headwaters within the boundaries of the forest parks, all plans of regulation or power development should be executed only by the State, and all reservoirs and their appurtenances and the impounded waters should be the property of the State and under exclusive State control, and not be permitted to pass into private hands. Any such plan should embrace all necessary safeguards to ensure the proper protection of the forests.
>
> "(3) That with respect to any other streams flowing through any other public park or reservation of the State, such plans should likewise be executed by the State and it should retain exclusive ownership and control in order adequately to safeguard the State's interests.
>
> "(4) That further, as it is of great public importance that the water powers of the State should be developed in a comprehensive manner and that these natural sources of industrial energy should not become the subject of an injurious private control, such development should be undertaken by the State whenever such action appears to be feasible and for the general interest.
>
> "(5) That in any case of State development of water power provision should be made for the granting of such rights as may be proper, to use the power so developed upon equitable terms and conditions.
>
> "(6) That the State should not undertake any plan of regulation or water-power development save upon a basis which would make its investment a fair and reasonable one

> from the public standpoint by virtue of practicable measures for ensuring such a return upon the State's outlay as would be equitable in the particular circumstances.
>
> "(7) That any amendment of the Constitution at this time for the purpose of permitting any portion of the forest preserve to be used for any such purpose should, by its terms, or by appropriate reference, suitably define the property within the preserve which is to be used and the manner of its use. No amendment and no plan of development should meet with any favor which, after the most rigid scrutiny, does not afford absolute assurance that in no way will the public interest in the forests be parted with or jeopardized."

LEGISLATION.

In accordance with the requirement of the Fuller Act and the recommendations of the Governor, the Commission with its last annual report, submitted a draft of a bill for a general law. This draft was considered by the Legislature, hearings were given upon it, its provisions were thoroughly discussed and changes were made in certain particulars. In its final perfected form it provided a scheme of general conservation and development of water powers by the State, which in brief outline was as follows:

> Any person may petition the State, through the State Water Supply Commission, to construct a storage reservoir. The petition must show that the reservoir will produce an annual net revenue to the State by the lease of the water stored or of the power generated thereby or by assessment for benefits resulting therefrom. The petitioner must guarantee to the State a gross revenue sufficient to pay operating expenses and interest and sinking fund charges upon the cost of the reservoir.
>
> If the Commission has not already prepared plans covering the project, it must proceed to prepare them and if conflicting petitions are filed, it may co-ordinate them. Within thirty days after the filing of a petition or the completion of plans it must accept or reject the petition and give its reasons therefor.

If the Commission approves a petition, it must lay it before the Governor, with the plans and estimates relating to it, and if the Governor approves it, he must within thirty days, direct the Commission to proceed to build the reservoir.

The Commission without petition may present to the Governor a reservoir project which will yield a net revenue to the State.

Any project involving a stream whose waters are used for canal purposes must be submitted to the Canal Board for a statement as to its effect upon the canals before it is submitted to the Governor.

Real estate required for the execution of the work may be appropriated upon notice when needed and if compensation cannot be agreed upon with the owner by the Commission, the Court of Claims is authorized to make an award which the Comptroller is directed to pay.

The work of construction must be done under contract approved by the Governor.

The Commission is authorized to make and enforce rules for the maintenance and operation of storage reservoirs.

The Commission may lease for terms of not more than fifty years the right to use water from any State storage reservoir or the power developed therefrom for a sum which shall not be less than the interest, sinking fund and operating charges, and the rental shall be a tax upon the property benefited.

In consideration of benefits to be conferred, the Commission may enter into a contract for a reasonable consideration with any person or corporation, municipal or otherwise, and the sum so agreed upon shall be a tax upon the property benefited.

When no contract exists, the Commission is directed upon the completion of the reservoir and at five year intervals thereafter to assess the value of the yearly benefit upon the property and the municipalities benefited, and the assessment shall be a tax upon the property or the municipality. Hearings must be given by the Commission upon assessments and its decisions may be reviewed in the manner provided by the Tax Law.

All moneys received must be paid into the treasury to the credit of a fund to be known as the State Water Storage Fund from which appropriations may be made for paying the cost of maintaining and operating reservoirs, for additions to the sinking fund to retire water storage bonds, for building other storage reservoirs and for deposit to the general credit of the State.

Bonds limited in amount to $20,000,000, in interest to 4 per cent., and in term to fifty years, shall be issued by the State to provide funds for building storage reservoirs as money may be required for payments under contracts. Not more than $2,000,000 may be issued in the year after the act takes effect, and thereafter the bonds shall be sold in lots of not more than $1,000,000. For each $1,000,000 of bonds outstanding, a State tax of twelve one-thousandths of a mill is imposed for the payment of the interest and sinking fund charges until the sinking fund shall equal the principal of the bonds, after which time the tax shall be reduced to an amount equal to the interest alone.

It is expressly declared that nothing in the act shall be deemed to confirm any right or privilege claimed, or to impair any right or power now belonging to the State. The Commission, for the State, is empowered to revoke any use of real estate for private purposes under the authority of or by sufferance of the State in cases where the State can revoke.

The bill, when approved by the Legislature and the Governor, must be submitted to the people for their approval in the general election of 1911 and will take effect only when approved by a majority of the voters who vote upon it.

The full text of the proposed general law will be found in Appendix D of this report.

While in the preparation of the bill the Commission was constrained to follow the directions given in the Fuller Act, it believes that the proposed measure, if adopted, will prove in operation to be of incalculable advantage both to the State and to the owners of water power sites upon rivers whose flow can be regulated and equalized by the construction of storage reservoirs.

The Commission is aware of the fact that some of the riparian owners upon rivers whose full power capacity can be developed only by storage of water that now runs to waste expressed dissatisfaction with the measure during the last session of the Legislature. It believes that their opposition was short sighted, and that dispassionate consideration cannot fail to remove it. Public attention everywhere has been forcibly directed to the conservation and development of water powers as one of the most valuable of public resources. It seems to the Commission inevitable that in the near future this State must undertake the systematic development of this resource, and that, if the adoption of a fair and reasonable profit-sharing policy, such as that proposed by the measure which has been outlined, is rejected, the State may be driven into the position of a competitor with established private industries.

STATE CONTROL OF WATER POWERS.

Upon the question of the control of water power developments by means of water storage and the regulation of stream flow, there has been a divergence of opinion even among the riparian owners enjoying water power rights. The owners of such rights upon the upper Hudson and the Genesee rivers, the two most important available water power possibilities in the State, have signified their belief that the storage reservoirs should be owned and controlled by the State and also their willingness to pay in the form of rental or benefit assessment sums which would constitute an annual income to the State; the owners of water power rights upon the Black river and some other Adirondack streams, on the contrary, take the position that the State should build storage reservoirs even upon State land, and that after the cost has been paid by assessment upon the property benefited, they should have the right to the free and perpetual use of the resultant equalized flow.

The Commission in its previous reports has discussed at length the various considerations involved, reaching the conclusion that the public interest plainly requires State control of water power developments and a system of management which will enable the State to derive a revenue from the sale or lease of the additional water power made available by such developments, and with opportunity for a revision at suitable intervals of the terms of such sale or lease. A brief recapitulation of the reasons which have led to this conclusion may be given:

(1) Water power differs from every other form of power, in that it is constant and perpetual. Its development, particularly in the form of electrical energy, is in its infancy. It is impossible to predict its future value. Sound public policy demands that, as its most valuable resource, the State should retain the largest possible measure of control, so that the power may forever be employed for the public benefit.

(2) Experience everywhere proves conclusively that the prosperity of industries dependent upon water power is best served by State control, and all progress in legislation has been along this line.

(3) The public interest demands that there should be the fullest possible development of water powers. Such development can be brought about only by the State, since in many cases economy would not warrant it in private enterprises.

(4) The right to condemn lands for water storage purposes can be exercised only by the State and for the benefit of the public.

(5) The financial strength of the State enables it to borrow money to pay the cost of the work at a lower rate of interest than it would be possible for individuals to obtain.

(6) The State alone by assessment can compel each beneficiary of an improvement to pay a just proportion of the cost, and by State operation only can an equitable distribution of the stored water be made. Experience has shown that it is practically impossible for various reasons to combine competing private interests in the development and use of water power.

(7) The sanitary conditions which should be taken into consideration in storage reservoir construction and operation cannot be assured through private construction and control.

(8) Development and control by the State would promote new industries, while private development and operation promote existing industries only and tend to discourage new industries.

(9) The safety of dams built for water storage can be assured only by State construction in which it would be paramount to any question of expense.

(10) The supply of water available for power purposes is limited, thus creating a situation which invites the establishment of combinations tending to monopoly and harmful to the public interest. State control provides a complete barrier to such combinations.

(11) The benefits to navigable streams which should result from water storage can be assured only through State ownership and control of storage reservoirs.

(12) Under State control the shores of the lakes formed by storage reservoirs can be so treated and maintained as to make these lakes attractive health and pleasure resorts, thus benefiting surrounding communities instead of injuring them. Private owners have no business interest in this object and in fact pay little regard to it.

(13) Many miles of navigation may be added to the waters of the State by State control by thorough clearing of reservoir sites and the retention of a sufficient minimum depth of water in the reservoir at all times. Private control does not preserve this advantage.

(14) Storage under State control may be so managed as to bring about the establishment of new industrial communities by the utilization of the additional water power at or near the dam without diminishing the benefit to existing industries.

(15) Water supplies for other than industrial purposes can be protected only through supervision by the State.

(16) By the adoption of a definite and comprehensive State policy of control, the location of roads, railroads and buildings in prospective reservoir sites can be prevented and a large part of the expense in the eventual purchase of the site can be avoided. This cannot be accomplished in any other way.

(17) Under State control the possible future needs of the canal system can be considered and economical provision made for them.

(18) The State alone can plan a comprehensive scheme of water power development and execute it in accordance with the relative importance of each project.

(19) Through the establishment of State control and development upon well defined and reasonable terms it is probable that the people will consent to the use of the State land in the Adirondack Park, which is absolutely necessary to the development of some of the most valuable water powers, and it is unlikely that the use of the land will be permitted for the purpose of private development and control.

LOSSES DUE TO DELAY.

In the prosecution of its work, the Commission has been hampered by the existence at the same time of a definite statute prescribing the method by which river improvements shall be made, even though they may involve water storage, and of a legislative command to prepare for the prosecution of water storage projects by an entirely different method. The industries which have suffered from a preventable lack of water power have sustained serious loss from the same cause.

Owing to the uncertainties of the situation the Commission deemed it its duty to delay action upon the applications for the improvement of the upper Hudson and of the Genesee rivers pending the passage of the legislation needed to embody in the statute the policy so definitely indicated by the Fuller Act, and in this position the power users upon these rivers acquiesced.

It was apparent to all that a waste of time and money would be caused by beginning an improvement under plans drawn in accordance with a statute which was about to be superseded by a different statute.

While complete statistics of the losses caused to industry by the absence of river regulation are not obtainable, partial statements have been made to the Commission by the representatives of power users in Northern New York. It is stated that during the summer of 1909 forty-two paper and pulp corporations in that portion of the State, representing an investment including capital stock, bonds, etc., of $38,664,218 and a daily production of 1633 tons of paper, valued at $64,095, and 1756 tons of pulp valued at $37,499, were idle for a total of 2503 days on account of low water. The loss in value of product, as reported by the corporations, was $3,707,069 and the loss in wages on account of enforced idleness was $293,545.

Figures for eleven months of 1909 for three mills belonging to the International Paper Company were given by the representative of that company during a recent hearing as follows: At Corinth, where 633 men were employed, a daily average of 102 men were laid off; at Glens Falls, where 255 men were employed, a daily average of 177 men were laid off; at Fort Edward, where 363 men were employed, a daily average of 152 men were laid off. The loss in wages during that period was stated as $257,544. The representative of the company added that not a day nor a dollar would have been lost if the flow of the Hudson had been regulated by means of water storage.

It is thus shown that while the delay has been injurious to the State owing to the fact that it has postponed the enjoyment of the benefits which will be derived from river regulation in the shape of improved navigation, decreased flood damages and better sanitary conditions, it has also proved a cause of serious loss to industry. In view of this situation the users of water power upon the two rivers mentioned have insisted upon procedure under the only existing statute, that is to say under the present law providing for river improvement. While it has seemed to the Commission that in fairness to the business interests involved longer delay should be avoided, nevertheless it is of the opinion that the best interests both of the State and of the owners of water power require the adoption of a comprehensive plan under which these improvements and others may be prosecuted upon terms more advantageous than the river improvement law permits.

New Water Power Development.

The water power census made by the Commission in 1908 showed a total of 618,942 stated horse power in use at 1824 plants with a total capacity of 829,558 water horse power. Comparison of the results of this census with those of the United States Census of Manufactures in 1905 showed that during the intervening three years, there had been an increase of 172,790 horse power, or about 39 per cent. The increase since 1908 has been rapid.

Niagara River.

In the water power census of 1908, the horse power in use at Niagara Falls was stated at 145,400 and the total horse power capacity of the plants at 198,600 horse power. The water horse power now in use at Niagara Falls is 180,000 horse power and a bill is pending before Congress to permit an increase to 250,000 horse power.

As a result of protests made against a possible excessive diversion of water from Niagara Falls which might result in the impairment of their scenic beauty, negotiations for a treaty with Great Britain to limit the amount of water which might be diverted from the falls on both sides of the river were begun. Pending the conclusion of the treaty, Representative Burton of Ohio introduced a bill in Congress which became a law on June 29, 1906. This law, known as the Burton Act, limited the amount of water that might be diverted from the falls on the American side to 15,600 cubic feet a second, and in order to discourage the taking of water on the Canadian side, it limited the amount of electrical current that might be imported from Canada to 160,000 horse power. As the chief market for hydro-electric power developed in Canada was on this side of the river, the expedient proved effective. The Burton Act, which originally was limited to three years in its operation, was extended in 1909 two years more, and will expire on June 29, 1911.

On May 13, 1910, a treaty between the United States and Great Britain was proclaimed. It limits the diversion of water from the Niagara river at the falls to 20,000 cubic feet a second on the American side and to 36,000 cubic feet a second on the Canadian side. It makes no provision regarding the importation of electrical power from Canada.

To meet the situation which will be created by the expiration of the Burton Act, a measure has been introduced in Congress giving the existing companies the right to appropriate the 4,400 additional cubic feet of water a second which the treaty permits to be diverted on the American side of the river. This would yield from 40,000 to 50,000 additional horse power.

The right to use the waters of the Niagara river for power purposes was granted originally by the State without provision for compensation to the State for the privilege. Objection has been made to the pending bill on the ground that it proposes to give the right to use the additional water allowed by the treaty without compensation either to the State or to the National Government. It has been suggested that advantage be taken of the opportunity to impose conditions with respect to compensation which will be more in accord with the present view of the terms upon which water power privileges should be granted than were the terms of the original grants made by the State.

Lake Erie Storage.

Water storage in Lake Erie by means of a dam at the Niagara river outlet is contemplated in plans which are being prepared by the International Waterways Commission. On this subject the Secretary of War in his annual report for 1910 said:

> "Among the various duties which were enjoined upon the commission, it was specifically required that they should 'report upon the advisability of locating a dam at the outlet of Lake Erie, with a view to determining whether such dam will benefit navigation.' The term dam as here used may apply to either regulating works or compensating works. Regulating works are those designed to raise the low water without raising the high water surface; that is, to reduce the amount of oscillation in the lake's level. Compensating works are those designed to raise the general level of the lake, at high water as well as low water, without essential change in the amount of oscillation. The former being the more desirable, if feasible, have been the subject of careful investigation by the commission for several years. The conclusion which they reached being adverse to this class of works, it became necessary for them to consider the second kind, and as this involved considerable further delay they submitted the results of their studies upon the first branch of the subject in a report dated January 8, 1910. This report was forwarded by me to the President and was by him transmitted to Congress by his message of March 14, 1910. * * * In the investigation of the second branch of the subject additiona

> surveys have been found necessary. Of these the field work has been completed, and the construction of the maps has made good progress. The commission expects to submit a report upon compensating works for the outlet of Lake Erie during the coming year."

St. Lawrence River.

Water power in actual use in the St. Lawrence river, including the Oswegatchie, Grasse, Raquette and St. Regis rivers, was found to be 86,313 horse power by the water power census of 1908 at 158 plants with a total capacity of 115,583 horse power.

Application has been made to Congress for permission to develop from 600,000 to 650,000 horse power at the Long Sault on the St. Lawrence river. The consent of Canada must also be obtained before the project, which is to represent an investment of from $40,000,000 to $50,000,000 can be carried out. The Long Sault Development Company was chartered by the State of New York in 1907 to develop the power on the American side and the St. Lawrence Power Company was incorporated in the Province of Ontario to make the development on the Canadian side. Both are said to be controlled by the Aluminum Company of America, which is to employ the power for the extraction of aluminum from clay obtained in Arkansas. For this purpose the company is now operating a plant of from 35,000 to 40,000 horse power at Massena.

The grant made to the Long Sault Development Company in 1907 gave perpetual right to use the water upon the following terms:

After Congress has authorized the construction of the development works and after the payment of $10,000 by the company to the State, the Commissioners of the Land Office shall grant land under water actually required for the development works. The company was required to pay to the State $15,000 for the year 1910, and $20,000 for the year 1911, after which the company is required to pay annually to the State seventy-five cents for each electrical horse power generated up to 25,000 electrical horse power; fifty cents for each electrical horse power generated over 25,000 electrical horse power and up to 100,000 electrical horse power; and twenty-five cents for each electrical horse power generated over 100,000 electrical horse power. If the corporation shall use the water power without transforming it into electrical power then the rates specified for electrical power shall be applicable to the water power used. After the year 1911 the company is required to pay at least $25,000 a year to the State.

Authority was granted by the Public Service Commission for the Second District to the New York and Ontario Power Company of Waddington on January 14, 1909, to issue $600,000 common capital stock and $1,850,000 bonds for the development of 30,000 continuous water horse power from the St. Lawrence river.

Salmon River.

For the purpose of developing 15,000 horse power at Salmon River Falls, the Oswego County Light and Power Company was authorized by the Public Service Commission for the Second District, on May 27, 1909, to increase its capital stock from $100,000 to $1,000,000 and to issue fifty-year bonds to the amount of $2,353,000.

Deer River.

Development of 1,740 water horse power on the Deer river at High Falls in Copenhagen by means of the construction of a dam, was provided for in the authorization granted to the Deer River Power Company on August 11, 1909, by the Public Service Commission for the Second District. The Company asked leave to issue $25,000 capital stock. The existing water power development at Copenhagen was shown by the water power census of 1908 to be 155 horse power.

Garoga Creek.

By the construction of a dam at Garoga, in Fulton county, the Mohawk Hydro-Electric Company proposes to develop 7,600 water horse power which will be used to generate electricity for light, heat and power purposes. The dam, which is practically completed, will create a large storage reservoir. This is a new development.

East Canada Creek.

An increase of water power development from 467 horse power, as shown in the water power census of 1908, to 15,000 horse power, is proposed by the East Creek Electric Light and Power Company. The development is planned to be made at Ingham's Falls in East Canada creek. The Public Service Commission for the Second District on April 21, 1910, authorized the company to increase its capital stock from $200,000 to $500,000 and to issue bonds to the amount of $1,750,000 to meet the cost of the work.

TREND OF PUBLIC SENTIMENT.

The trend of public sentiment in favor of State ownership, development and control of water power resources has been unmistakably indicated during the last few years. The agitation for the establishment of this principle has been widespread and has met with a ready response.

In the declaration of principles, adopted by the Conference of Governors in Washington, in May, 1908, the following principles were affirmed:

> "We declare our firm conviction that this conservation of our natural resources is a subject of transcendent importance, which should engage unremittingly the attention of the Nation, the States, and the people in earnest cooperation. These natural resources include the land on which we live and which yields our food; the living waters which fertilize the soil, supply power, and form great avenues of commerce; the forests which yield the materials for our homes, prevent erosion of the soil, and conserve the navigation and other uses of the streams; and the minerals which form the basis of our industrial life, and supply us with heat, light, and power. * * * We recognize in our waters a most valuable asset of the people of the United States, and we recommend the enactment of laws looking to the conservation of water resources for irrigation, water supply, power, and navigation, to the end that navigable and source streams may be brought under complete control and fully utilized for every purpose."

The North American Conservation Congress held in Washington in February, 1909, and participated in by Commissioners representing the United States, the Dominion of Canada, the Republic of Mexico and the Colony of Newfoundland, in its declaration of principles adopted the following:

> "We recognize the waters as a primary resource, and we regard their use for domestic and municipal supply, irrigation, navigation, and power, as interrelated public uses, and properly subject to public control. We therefore favor the complete and concurrent development of the streams and their sources for every useful purpose to which they may be put.
>
> "The highest and most necessary use of water is for domestic and municipal purposes. We therefore favor the recognition of this principle in legislation, and, where necessary, the subordination of other uses of water thereto.
>
> "The superior economy of water transportation over land transportation, as well as its advantages in limiting the consumption of the nonrenewable resources, coal and iron, and its effectiveness in the promotion of commerce, are generally acknowledged. We therefore favor the development of inland navigation under general plans adapted to secure the uniform progress of the work and the fullest use of the streams for all purposes. We therefore express our belief that all waterways so developed should be retained under exclusive public ownership and control.
>
> "We regard the monopoly of waters, and especially the monopoly of water power, as peculiarly threatening. No rights to the use of water powers in streams should hereafter be granted in perpetuity. Each grant should be conditioned upon prompt development, continued beneficial use, and the payment of proper compensation to the public for the rights enjoyed; and should be for a definite period only. Such period should be no longer than is required for reasonable safety of investment. The public authority should retain the right to readjust at stated periods the compensation to the public and to regulate the rates charged, to the end that undue profit or extortion may be prevented.
>
> "Where the construction of works to utilize water has been authorized by public authority, and such utilization is necessary for the public welfare, provision should be made for the

expropriation of any privately owned land and water rights required for such construction.

"The interest of the public in the increase of the productiveness of arid lands by irrigation and of wet lands by drainage is manifest. We therefore favor the participation of the public to secure the complete and economical development and use of all water available for irrigation and of all lands susceptible of profitable drainage, in order to insure the widest possible benefit special projects to be considered and developed in connection with a general plan for the same watershed. In the matter of irrigation, public authority should control the headwaters and provide for the construction of storage reservoirs and for the equitable distribution and use of the stored water."

The National Conservation Association advocated the following:

"The preparation, by a commission appointed by the President of the United States, of a comprehensive plan for waterway improvement, extending to all the uses of the waters and the benefits to be derived from their control, including navigation, with the relation of railroads and terminals thereto, the development and disposition of water power, the irrigation of arid lands, the drainage of swamp and overflowed lands, the control of floods, the prevention of soil wash, and the purification of streams for water supply.

"The immediate undertaking and continuous prosecution of works clearly necessary under such general plan.

"The incorporation into all future grants of water power rights by state or nation of provisions to secure the following:

"(a) Prompt development on pain of forfeiture of the grant.

"(b) Payment of reasonable compensation for the benefits granted by the people with periodic readjustment of the rate of compensation, so as to insure justice both to the investor and to the public.

"(c) The limitation of all such grants to periods not exceeding fifty years, and the reservation of the right to terminate and acquire or reconvey the grant for proper cause and upon equitable compensation; together with proper inspection and publicity of records and accounts.

"(d) Recognition of the right of the appropriate public authorities to make reasonable regulations as to rates of service.

"The termination of all existing permits or grants for the development of water power and the substitution of new grants involving the foregoing principles as soon and to such extent as may be consistent with the terms of the existing grants.

"The support and extension of the irrigation of arid lands and the drainage of swamp and overflowed lands."

Constitutional Limitations.

It was the influence of this sentiment at its beginning that put the hard and fast amendment of section 7 of Article VII into the Constitution of the State.

This amendment has no doubt tied up and delayed forest culture in the Adirondacks on State lands; it also stands in the way of conservation on any broad and systematic plan by the storage of flood waters.

This sentiment has not abated, but has increased in intensity during the ten years past, and gathered fresh vigor in favor of State development and ownership for a public revenue. No plan that does not recognize such a policy can induce the people to change its fundamental law by amending section 7 of Article VII of the Constitution.

This Commission is convinced not only from public sentiment, but by careful study of the principles of conservation and of the duty of the State toward such an enterprise, that the building of storage reservoirs is a proper function of State government, and that such reservoir building should have in view a direct revenue to the State aside from the indirect benefit to individuals, corporations and municipalities and other civil divisions of the State.

We believe that when the people come to understand the plan of the Commission for conservation and water storage, they will willingly consent to such a change in the Constitution as will permit the storage of flood waters.

PUBLIC AND PRIVATE RIGHTS.

There is controversy over the extent of public and private rights in the waters within the State. It is hardly necessary to say that private rights cannot be infringed, nor can private property be taken without compensation and due process of law. The uncertainties of the situation make it difficult to frame legislation which will protect all interests. Many of the States have sought by constitutional provision to define the limits between public and private ownership, and it is possible that this State eventually may find it advantageous to adopt this plan.

CONTROL BY THE FEDERAL GOVERNMENT.

Advocates of the extension of Federal powers have suggested that the national government may properly build water storage reservoirs upon navigable streams to which jurisdiction extends under the authority granted to it by the United States Constitution to regulate commerce between the States, and it has even been urged that the national government might construct reservoirs for storage upon the headwaters and the tributaries of such streams as well as upon streams which form the boundary between States. There is no Federal law authorizing the building of reservoirs for water power purposes, but surplus water from reservoirs built by the Nation for the regulation of river flow in the interest of navigation and for irrigation may be sold to water power users. Under this authority 3,243 water horsepower was sold in 1908 by the Federal government for $5,600. The sales were made chiefly from reservoirs built to regulate the flow of the Ohio river.

An important instance of Federal water power development in this State is involved in the construction of the proposed new dam at Troy as part of the Federal plan for improving the navigation of the Hudson river. The surplus water from the present Troy dam, which was built as a part of the canal system, has been sold by legislative grant for the nominal price of $300 a year to a water power company for the use of industries in Troy. It is proposed that the State shall abandon its rights in the water power to the national government in consideration of the Federal expenditure to be made upon the Hudson. The government may then sell the surplus water stored by the new dam.

The utilization of Niagara Falls for water power has been limited by a treaty between the United States and Great Britain under the terms of which a maximum of 20,000 cubic feet a second may be taken on the American side and 36,000 cubic feet a second on the Canadian side. This treaty provides that the level of Lake Erie must be maintained.

Canada exacts rentals for the use of water power at Niagara Falls as follows: 10,000 horse power, $15,000 a year; over 10,000 horse power and under 20,000 horse power, $1 per horse power per year; over 20,000 horse power and under 30,000 horse power, 75 cents per horse power per year; all over 30,000 horse power, 50 cents per horse power per year.

METHODS OF PUBLIC CONTROL.

Inquiry into the laws and regulations of other countries in relation to the development and use of water power reveals a uniform tendency toward the assumption of public control, the limitation of grants and the exaction of a rental for use. In some cases the government reserves the right to purchase the plant at cost at the end of a specified number of years.

Switzerland and the Province of Ontario, Canada, may be selected as affording examples of well developed although diverse policies. One has taken possession of the water powers within its borders; the other, following the English law of riparian ownership, has left the water powers in private control but has assumed the task of distributing the power when converted into electrical energy.

Switzerland is prolific in falling water capable of transformation into electrical energy. Before 1908 the flow of the streams belonged to the several Cantons, and concessions for water power development were granted on the basis of annual payment to the State. The national government assumed general jurisdiction over the streams in 1908 through an amendment to the Constitution which was approved by the people by a vote of 292,997 to 52,180. This amendment is as follows:

> "Article 24b. The Federal Congress shall have supervision over the development of water powers.

> "The Federal Congress shall make provision for the distribution of water-right concessions, shall prescribe the terms thereof, and shall regulate the transmission and distribution of electrical energy so far as may be necessary to protect public interests and to provide for the proper development of such resources.
>
> "All water-rights to which the terms of the Federal law do not extend shall be under the jurisdiction of the Cantons, which shall dispose of the concessions, regulate the same, and impose taxes and fees for their use, but such regulations, taxes, and fees shall not be so severe as to prevent or inhibit the development of water powers.
>
> "The national government shall regulate and dispose of concessions for powers located on intercantonal and national boundary streams, and shall determine the taxes and fees to be imposed thereon, after hearings have been granted to the Cantons interested, but such taxes and fees shall be collected by the Cantons.
>
> "No power developed on a stream located within the Union shall be transmitted to a foreign country without the consent of the Federal Council.
>
> "The provisions of the Federal law shall apply to water-right concessions already existing, except in cases specifically exempted therefrom by law."

The province of Ontario until 1898 made no reservation of water powers in grants of public land. A law passed in 1898, however, reserved all water powers of more than 150 horse power minimum and provided for the leasing of such powers upon the following conditions: (1) Payment of an annual rental; (2) development within a specified time; (3) the supplying of surplus power to those requiring it upon conditions and rates to be determined by the government; (4) full development whenever the government decides that there is a demand for the power. Under this act, at the beginning of 1910, twenty water powers had been leased with a minimum development of 26,600 horse power and a maximum of 53,700 horse power, at an annual rental of $12,000.

Complaint was made in 1900 that the water powers of the Province were falling into the control of monopoly and that excessive rates were being charged for power. After much agitation, the Hydro-electric Power Commission of Ontario was created in May, 1906. It is authorized to collect and report information regarding water and electrical powers, and upon power and lighting needs. With the authority of the Lieutenant-Governor-in-Council it may purchase, lease or condemn lands, water powers, water privileges, electrical current and power and distributing plants which it may operate. It may make contracts with municipal or other corporations to supply power or light, controlling the rates charged by them, and it may borrow money for these objects. The Commission has contracted for the purchase from the Ontario Power Company at Niagara Falls of from 8,000 to 100,000 horse power at the rate of $9.40 per horse power per annum up to 25,000 horse power, and $9 per horse power per annum above 25,000 horse power. This current is sent over transmission lines to the various cities in the southern part of the Province. The rates charged vary from $18.10 to $29.50 per horse power per annum according to distance. Fifteen municipal corporations were being supplied with an aggregate of 27,000 horse power in January, 1910. The plan has worked well as, while local prices have been reduced, the demand has been stimulated so that the private companies are prospering.

Canal and Highway Improvement.

It has been contended that as the State is expending large sums of money for the enlargement of the canals and for the construction of good roads, it should likewise bear the entire cost of water storage for power purposes. This argument is fallacious. The canals and the highways are open to the use of every citizen of the State without preference; the increased flow of streams, owing to the nature of the natural monopoly residing in water power sites, can be used only by the few who enjoy exclusive privileges therein. They are not even open to competition, since they cannot be sold to the highest bidder. Moreover, the canals paid to the State in tolls, up to the time when tolls were abolished in 1882, the sum of $134,900,020.58. The State may at any time, by constitutional amendment, re-establish tolls for the use of the canals and it may also exact tolls for the use of State highways; but when once it has alienated its rights in the streams it cannot recover them, excepting by purchase.

The plans for the enlargement of the canals and the construction of improved highways were submitted to the people of the State in referendum measures for their approval, and they received the sanction of the people. Certainly no plan for water storage at public expense should be adopted without similar sanction.

A large proportion of the industries using water power, especially in the northern part of the State, obtain their raw material from the forests. Much of the supply of this raw material has been furnished by the State, either from State lands or from lands which the State has permitted to pass temporarily from its ownership so that the timber thereon might be used. The consumption has outdistanced the supply which at present has become depleted, but with the adoption of a system of scientific forestry it will in large measure be renewed, greatly to the benefit of the industries to which reference has been made. This benefit should make them the more willing to pay the State reasonable compensation for the increase in power which they desire.

The payment of this compensation will not be made by the industries, but by the consumers of their product. The extremely favorable terms upon which it has been proposed to supply the additional power will leave manufacture a large margin of profit from its use after the State has been reimbursed. For example, it has been suggested that water power be leased annually at from $5 to $10 per horse power. Each such additional horse power is worth to manufacture from $20 to $25. In the form of steam it costs annually from $40 to $45 per horsepower.

INCREASE OF STREAM FLOW.

It may be argued with force that to increase the flow of a stream by means of a storage reservoir constructed and controlled by the State is in reality a new grant of water power made by the people to every water power site upon the stream below the dam. The flow of the stream is made up of the runoff from a drainage area usually embracing several hundred and sometimes upward of a thousand square miles. The surplus water is impounded by the State in a basin taken from private owners by eminent domain — that is to say, for a public benefit. Usually it can be acquired in no other way. The reservoir is built with public money at a less cost than private construction would involve.

On this theory it would seem only fair that those who obtain a direct financial benefit from the exercise of the authority of the State should be willing not only to repay the State for its outlay but to contribute to the public treasury a small share of the increased annual profits which the interference of the State has enabled them to make. And it certainly is not unreasonable that the benefits received under leases should be reappraised and the rate of payment therefor readjusted once in a generation.

In connection with the construction of the Chicago Drainage Canal, at an estimated cost of $20,000,000, it is proposed to make a fourteen-foot channel to the Mississippi river, capable of producing 140,000 horsepower, of which at least 100,000 horsepower will belong to the State. The plans contemplate the lease of this power at the rate of $25 per horsepower per annum, thus creating an annual income of $2,500,000, or enough to extinguish the total debt with interest in seventeen years, after which time it is estimated that the State will derive an income from the work of $2,750,000 a year.

Hydro-electric power can be sold in New York State, because of the favorable conditions, at one-half the rate that must be charged in North and South Carolina and in California.

DANGER OF MONOPOLY.

Water power development from its nature is peculiarly liable to the establishment of a monopoly. It cannot be increased beyond a certain point and it can be used only by the possessors of water power sites. Its immense advantage over any other form of power and the fact that it is inexhaustible within the limits of its development have led those in a position to appreciate its value to obtain control of the greatest possible share. The United States Commissioner of Corporations has stated that thirteen companies already control 1,825,000 horsepower, or more than one-third of the entire development in the United States.

In his veto of a bill authorizing the construction of a dam for water power purposes across the James river in Missouri, President Roosevelt, in January, 1909, called attention to the tendency to monopoly in the control of water power rights. After quoting from the report of the Commissioner of Corporations, he said:

> "The movement is still in its infancy, and unless it is controlled the history of the oil industry will be repeated in the hydro-electric power industry, with results far more oppressive and disastrous for the people. It is true that the great bulk of our potential water power is as yet undeveloped, but the sites which are now controlled by combinations are those which offer the greatest advantages and therefore hold a strategic position. This is certain to be strengthened by the increasing demand for power and the extension of long-distance electrical transmission.
>
> "It is, in my opinion, relatively unimportant for us to know whether or not the promoters of this particular project are affiliated with any of these great corporations. If we make an unconditional grant to this grantee, our control over it ceases. He, or any purchaser from him, will be free to sell his rights to any one of them at pleasure. The time to attach conditions and prevent monopoly is when a grant is made.
>
> "The great corporations are acting with foresight, singleness of purpose and vigor to control the water powers of the country. They pay no attention to state boundaries and are not interested in the constitutional law affecting navigable streams except as it affords what has been aptly called a "twilight zone," where they may find a convenient refuge from any regulation whatever by the public, whether through the national or the state governments.
>
> "* * * The new legislation sought in their own interest by some companies in the West, and the opposition of other companies in the East to proposed legislation in the public interest, have a common source and a common purpose. Their source is the rapidly-growing water power combination.

> Their purpose is a centralized monopoly of hydro-electric power development free of all public control."

Legislation passed during the last session of Congress upon the recommendation of President Taft has brought about the withdrawal from entry of a large number of important water power sites on public lands in the West.

The reservation of water power sites during President Taft's administration covers 1,456,899 acres and many power sites on 135 rivers in eleven States.

In California, according to a recent statement of the United States Commissioner of Corporations, four hydro-electric companies, with 259,000 developed horsepower and probably 500,000 horsepower undeveloped, dominate the water power industry. Similar conditions exist in the Puget Sound territory, in Colorado, Montana, the southern peninsula of Michigan and the Carolinas.

Fortunately, the State of New York hitherto has escaped these conditions, largely, no doubt, because it owns the chief sources of water power in the Adirondack Park, and because it has withheld the right of eminent domain from water power companies.

The control of the Public Service Commissions over electrical power companies with respect to their rates, mergers and issues of securities is a further safeguard of the highest importance.

WATER POWER AND THE BARGE CANAL.

In the general plan for the conservation and utilization of water powers provision should be made by general enactment for the lease of the right to use surplus water impounded by the State in reservoirs built to store water for the Barge Canal. Provision should also be made for minimum rates and frequent readjustment. The methods by which these surplus waters have been disposed of in former years have been short-sighted and unbusinesslike. The Legislature in 1907 passed an act forbiding the making of any contract for the use of them until the final completion of the Barge Canal improvement, so that the situation is favorable for the establishment of a general policy regarding them.

In its last two annual reports the Commission called attention to the fact that water storage projects which are being executed to supply the Barge Canal with water involve questions of water power development and flood prevention. The conditions which make it impossible to include such canal work in a comprehensive scheme of water power conservation and river regulation are unfortunate.

A large storage reservoir with a dam near Hinckley is being constructed on West Canada creek. The present law gives no authority to provide for the regulation of the creek beyond the regulation incidental to the storage of water for the canal and for maintaining the minimum flow of the creek for the use of the power developments that are dependent upon it. This will conserve only about one-fourth of the total amount of water power that might be obtained from the reservoir, which might easily be made larger than is now contemplated, thus giving an opportunity for the development of water power sites below the dam that are at present undeveloped. No use will be made of other favorable storage sites on the creek, although the location of the stream in relation to populous communities assures a market for power. Serious floods have occurred upon the creek, especially near Herkimer, but it is impossible to make provision for their abatement through the construction of the Barge Canal reservoir.

The water taken from the creek for the canal is to be permanently diverted and carried for several miles in the channel of Nine Mile creek. There is a fall of about fifty feet where the diversion channel reaches the bed of Nine Mile creek, but by extending the channel for a short distance a fall of about 300 feet might be obtained, making possible the development of at least 5000 continuous horsepower.

Other illustrations are given in the report of the Consulting Engineer of the loss which must result from the fact that the law providing for the improvement of the canal did not take into account the possibilities of incidental water power development.

The danger of unwise disposition of the surplus water power created by storage reservoirs built in connection with the canals was illustrated in a bill presented to the last Legislature by the representatives from the Cohoes district. The State is constructing in the Mohawk river above the Cohoes falls a costly canal dam which is known as the Crescent dam. The bill gave a private water power company the exclusive right to use the power created by this dam, together with the privilege of using State land for the construction of a power plant and transmission lines, at a rental of from $3000 to $7500 a year. Referring to this bill, the State Engineer and Surveyor said:

> "I do not believe that any water power created by the Barge Canal should be disposed of, except under a general law which would cover all cases. I believe that such powers should be disposed of under conditions which will permit of competitive bidding so that the State may receive for its natural resources, developed by the expenditures of the State's money, an adequate return for its investment, and that these resources so developed may accrue to the benefit of all the people of the State rather than to one or two individuals or corporations.
>
> "I further believe that the powers thus created should not be disposed of except under lease for a limited period of years."

The measure failed to pass the Legislature, but it is obvious that in the absence of a settled and well-defined policy such valuable water powers may be disposed of piecemeal in the future as they have been in the past.

The revenue which might be derived from the lease of water powers created by the Barge Canal improvement is shown in the following table:

SUMMARY OF PRINCIPAL WATER POWERS CREATED BY BARGE CANAL.

LOCATION	Distributed hydraulic H. P. with economical development		Annual return for increase if leased at rates given below.			
	Present	With Barge Canal	Increase	$1.00 per H. P. year	$3.00 per H. P. year	$5.00 per H. P. year
Lockport[1]	1,700	4,530	3,130	$3,130	$9,390	$15,650
Rochester[2]	....	9,732	9,732	9,732	29,196	48,660
Baldwinsville	2,452	2,640	188	188	564	940
Oswego River	33,960	41,649	7,689	7,689	23,067	38,445
Vischer's Ferry	None	6,530	6,530	6,530	19,590	32,650
Crescent	None	6,980	6,980	6,980	20,940	34,900
Waterford	None	6,506	6,506	6,506	19,518	32,530
Total	....	....	40,755	$40,755	$122,265	$203,775

[1] Distributed power from water by-passed in winter and summer under 50 feet head waste assumed to remain as at present.

[2] Power from water wasted into Genesee river under 250 feet head.

CONCLUSION.

The people of this State looking back into its politico-economic history see a political division of the Nation so located and favored by natural conditions, that a virile, industrious and far-seeing population quickly made it an empire in influence and wealth, and the most populous and wealthy of all the States in the Union.

A mere glance at the State's political, industrial and economic history attracts and interests the investigating mind. It looks at its beginning, it studies its statutes, it investigates the grants received from the mother country, it reads the charters it has given to its own subjects, which became the State's political children, it admires the rapid growth of these corporations and is proud, as it has a right to be, of their success.

Such a mind cannot limit its investigation to grants, charters, statutes and books; it is compelled to find out if it can what part nature played in this marvelous development which has made us the first State of the Union and what, if any, were the rights of the people in the vast natural State resources. No honest history of the State's prosperity can overlook the fact that New York harbor, the Hudson river, the Adirondack mountains, the water falls, the natural route for a highway from tidewater to the lakes — the Erie canal — and many other natural advantages, contributed in no small way to such success.

Did the deep and safe harbor surrounding Manhattan island belong alone to those worthy Dutchmen who first settled here? The answer is no, and that the State very early in its history so declared by giving the exclusive right to navigate it to a company of its own choosing. Broader minds determined that the rights of so great a natural resource extended far beyond the shores of New York and that the harbor was a part of the great national domain. As such it belonged to any member of the Union who cared to anchor his boat in its waters.

Do the deep and slow moving waters of the Hudson belong to the riparian owner? The answer is quickly no. That it is a navigable stream; that the common law and law of nature and of nations is contrary to such an ownership.

Are the mountains, falls and other natural resources the property of adjoining or adjacent owners, or have the people of the State an interest in these resources? The answer under our law will depend upon the local condition at the particular location. Is the river boundary of the adjacent owner governed by the common or civil law?

Whatever the facts may be, the adjacent owner during a long series of years has come to believe that he has a legal right which no power can wrest from him. The fact that ever increasing drought is yearly diminishing the value of his rights as he claims them to be does not change his view as to his legal status, and perhaps it ought not. Although he is powerless to do anything to restore his property to its former value, and must see it continually and surely grow less, he is not yet ready to concede that the State has any right to increase by any means whatever, the value of his property. Such is the question that must be met if the natural resources, by means of storage reservoirs, are to be conserved in this State.

No policy of the State should be anything but wise and just to all of its citizens. It cannot afford to confiscate any one's property, neither can it afford to permit any property right, be it great or small, to stand in the way of material and needed progress, if such progress is made with due consideration of the rights of persons affected.

On all of those streams not navigable, where the common law controls, the adjacent owners of land own the bed to the center of the stream and have the right to the use of the natural flow of the river. This right is so entrenched in our jurisprudence that a person may be prohibited from interrupting the natural flow of a stream to the damage of the adjacent owner. This right to the flow of a river is as sacred as the ownership in any other species of property. He may dam the river and control the flow in any reasonable manner he likes so long as he does no damage to others and does not interfere with the rights of others whose right to use the waters are as extensive as his. He may impound the water and hold it captive to turn his wheels, under the restrictions as above, at will. He can utilize the full fall on his land. For all the years of the State's history these water rights have been respected and used in the industrial development of the State.

When the country was new — the forest extensive and the streams even in their flow throughout the year — the water powers bore an important part in the State's enterprises. Scarcely a stream in the State that was not harnessed to some water wheel which furnished the power to an industry. In many instances they became the basis of great manufacturing centers. As the years went by and as the forest was felled and as the even flow of the streams ceased, and as the local demand for power gave way, water for power purposes was finally abandoned, except on the large rivers and at favorable sites. At one time it was thought that water for power purposes would be abandoned entirely. Those whose use of it taught them the advantage of water over coal for power purposes were slow to concede to the opinion that all power plants must soon be abandoned. These owners kept pace with electrical development — they were quick to see the value of the discovery which enabled electricity to be carried a long distance for commercial purposes. They were encouraged by the scientific investigation of rainfall, runoff and stream gauging. The high floods in the spring of the year, the low water during the dry season, the increasing price of coal, the constant and growing demand for more water set not only the owner of power plants but also the State to studying the subject of water for power purposes.

These studies, which have been conducted with thoroughness and scientific accuracy, make it possible to compute the value of the present flow of the large streams at the wheels and also enable us to calculate the value of an increase in the regulated flow of such rivers.

Its lakes and rivers constitute, next to its soil, by far the most valuable of the natural resources of the State. The advantage which it enjoys in these possessions is indicated by the fact that large amounts of capital have been attracted from outside its borders for investment in their exploitation.

The extension and prosperity of the industries which are dependent upon water power are important, but vastly more important is the economic welfare of the State as a whole. Within two decades the industrially vital character of water power has been in part revealed. Its transformation into electrical energy, already capable of being transmitted 200 or 300 miles, is revolutionizing manufacture. Only a few years ago its benefit was confined to the borders of the streams which supplied it; now it is spread abroad over the State. The time seems not far distant when the prosperity of every industrial establishment will flourish or languish in accordance with its ability to obtain electrical power in sufficient quantity to meet its needs and upon terms permitting its use. The situation, therefore, involves not only the ultimate stability of a tremendous aggregate of enterprise, but what is even more important to the State, the happiness of that large portion of the population that is directly or indirectly dependent upon that stability.

It may not be going too far to say that upon its wisdom in dealing with this priceless gift of nature will hinge in important degree the future commercial supremacy of the State.

Within the memory of the present generation the public forest lands were being given away almost for the asking. They were not then believed to possess any value worth considering from the public viewpoint. The State to-day is buying back the lands upon which the forests grew, paying many times the sums for which it might once have purchased them, forests included, for the privilege of controlling them and protecting them until new forests shall have time to grow during the next sixty or seventy years. In a similar manner the State has permitted many of its most valuable water power sites to pass into private ownership. It seems certain that the time must come when it will buy them back again, as it is now buying back its denuded forest lands, and the price will be no trifle.

It is evident that in shaping its policy relating to water powers, the State must go either forward or back — it cannot stand still. The hardships and losses resulting from inactivity cannot be continued indefinitely.

In its efforts to promote the wise solution of the problem, the Commission has endeavored to keep steadily in view the best interest of all the people of the State. To take any other attitude, it has felt, would be a grave dereliction of duty.

It has not been unmindful of the urgent immediate necessities of the industries which have felt most sharply the pinch of the present situation. Their impatience is natural and their criticism of delay in the application of the obvious remedy, in so far as they themselves have not been responsible for the delay, is justifiable. If it has happened that some part of the criticism has been directed at the Commission, it can be borne with equanimity in the confidence that the future will amply justify the course that has been taken.

RECOMMENDATIONS.

The Commission recommends with regard to water storage for water power purposes as follows:

(1) *The enactment and submission to the voters of a general law providing for systematic development of water powers upon the principles laid down in chapter* 569 *of the Laws of* 1907, *and authorizing a self-extinguishing bond issue of not more than* $20,000,000 *in total amount.*

The draft of a bill for a general law submitted to the last Legislature by the Commission in accordance with the requirements of the statute, as elsewhere printed in this report, is commended for consideration.

(2) *The extension of the jurisdiction of the Commission to all storage reservoirs now owned by the State and not operated in connection with the canals, to the end that such reservoirs may be kept in repair and operated for the regulation of stream flow in the public interest.*

(3) *Appropriation for the continuance of surveys, stream gauging, rainfall measurement and the preparation of plans for water power development.*

The valuable studies of possible new developments of water power, which are contained in the report of the Consulting Engineer, are recommended for careful consideration. After reviewing the situation the Consulting Engineer says:

"With the Niagara developments at the western end of the State, the Hudson developments at the eastern end and the developments on the Genesee, Oswego and Black rivers and Canada creeks, there is evidently enough power available to make New

York the manufacturing center of the United States. When this fact is considered in connection with the magnificent and unexcelled transportation facilities by canal and rail alongside of which this power may be delivered, and the large urban population in the midst of which the power can be used, thus insuring a labor supply, it is clear that the only thing preventing New York State from becoming such a center is New York State herself."

In this conclusion the Commission fully concurs.

Respectfully submitted,
HENRY H. PERSONS,
JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

REPORT OF WALTER McCULLOH, CONSULTING ENGINEER.

ORGANIZATION.
MUNICIPAL WATER SUPPLIES.
RIVER IMPROVEMENT.
WATER STORAGE AND WATER POWER.

REPORT OF WALTER McCULLOH, CONSULTING ENGINEER.

ALBANY, N. Y., *December* 31, 1910.

To the State Water Supply Commission, Albany, N. Y.:

GENTLEMEN.— My report for the year ending December 31, 1910, is respectfully submitted hereunder.

ORGANIZATION.

Owing to the completion of the engineering work undertaken in 1909, and the practical depletion of the appropriation for surveys and investigation under the Fuller Act, the force of engineers was reduced on February 1, 1910, to an assistant engineer, two draftsmen, and two tracers for office work.

Upon the passage of the supply bill, making a further appropriation for the continuation of surveys and investigations and river improvement investigations, an allotment was made for the various branches of the work as follows:

Hydrographic work — stream gaging	$7,500
Hydrographic work — rain gaging	1,500
Hydrographic work — evaporation studies and incidentals	1,000
Maintenance of the Albany headquarters office	10,000
For power surveys and investigations in the eastern and southern divisions of the State	10,000
For power surveys and investigations in the western and central divisions of the State	15,000
For collecting data and making investigations in regard to irrigation and small power developments	2,000
Reserve for contingency	3,000
Total appropriation	$50,000

Your Commission thereupon directed your Engineers to undertake the following work for the season of 1910.

Surveys and investigations for power possibilities referred to in our previous reports on the Black river and its tributaries, the Oswego-Seneca river and its tributaries, including the Finger lakes; also a complete power survey on the Hudson river from Troy to Hadley, and a similar power survey on the Genesee river.

The Engineering Corps has been organized as follows with men in the employ of the Commission and others taken from the certified civil service lists:

Mr. A. H. Perkins, Division Engineer, has direct charge of all surveys and other field work. His headquarters is at Albany.

Mr. Russell Suter, Assistant Engineer, is in charge of the surveys on the Black river.

Mr. A. H. Higley, Assistant Engineer, is in charge of surveys on the Genesee river and the construction work for the Canaseraga creek improvement.

Mr. B. F. Vandervoort, Assistant Engineer, is in charge of the power surveys on the Hudson and Genesee rivers.

Mr. E. H. Sargent, Assistant Engineer, is in charge of the drafting room corps in the headquarters office.

The parties under the direction of these Assistant Engineers have been appointed from the lists and included one junior assistant engineer, four levelers, four rodmen, five chainmen, one draftsman, three tracers, nine axemen, and four to six laborers, as their services were required. The force on the Black river remained in the field until November 15th. The force on the Canaseraga creek is still employed in field and office work preparatory to the construction of the proposed creek improvement, and the force engaged in making power surveys on the Hudson and Genesee rivers completed the field work on November 12th. With the exception of the Canaseraga creek force, all of the field parties are now in the Albany office working up their field notes for permanent record and plotting the same on maps.

The total amount of money expended during the year by the engineering bureau, exclusive of the Canaseraga creek work, is $29,305.15, as per vouchers and reports presented from time to time and on file in the Secretary's office.

MUNICIPAL WATER SUPPLIES.

The maps, plans, specifications and estimates filed with applications for water supply, have been examined and reported upon for twenty-five applications, being Nos. 68 to 92 inclusive.

The most of the petitions comtemplated simple plans for securing a source of water supply by a village or town then without any adequate supply, and as they met with little or no objection, there is nothing worthy of mention in connection with them. Attention may be called to several cases as presenting more important matters.

Application No. 70. The Village of Pike. Petition presented February 3, 1910. The Commission held a hearing in the village of Pike at a time when the ground was covered with so much snow it was impossible from an inspection to form a proper judgment as to the adequacy of the water supply from the source proposed to be used, but on the strength of the report made by the engineer employed by the village, and upon the testimony presented at the hearing, the application was granted. When the reservoir was completed in September, it was discovered that the source of supply had practically failed. There was not sufficient water flowing from the so-called springs to fill a one-inch pipe. Fortunately, there was another spring about half a mile distant, which it is believed will supply the deficiency. This case emphasizes the advisability of having long-time records of the flow of a spring before it is adopted as a source of water supply.

Application No. 72. Otisville Water District. Considerable opposition was raised to this application by the Erie railroad and by the Erie Land Improvement Company, both of which have large interests in the district. The petition contemplates a gravity supply from springs in the hills near the village. The opposition to the plan alleged that the supply is inadequate and that the cost of the works will greatly exceed the engineers estimates. However, after taking testimony and hearing arguments by the attorneys in the case, the application was finally granted on November 30, 1910.

Application No. 74. City of Plattsburgh. Petition presented March 24, 1910, for the right to take water from the Mead brook. This application was pending for several months on account of a question as to the feasibility of the plan proposed by the city, and also on account of the positive evidence of pollution in the water sought to be used. The city of Plattsburgh had, by petition presented January 19, 1907, duly obtained the right to take water from the West brook, which had a larger watershed, and a purer, more abundant and more wholesome supply, but no work was ever done under the application thus granted. The pending application was therefor denied and the city was advised to take water from the West brook in accordance with the petition therefore granted. By this action the city of Plattsburgh has been saved an expenditure of $50,000 on a water supply which would have proved inadequate and unwholesome.

Application No. 80. Village of Moravia. Presented on July 6, 1910, contemplated securing an additional supply of water from a system of springs which the village had agreed to purchase. The village had suffered from an epidemic of typhoid fever in February and March, 1910, and upon an examination being made of the water it was found to be highly contaminated. The village authorities thereupon arranged with parties owning springs on a hill to the southeast of the village and made their plans for acquring these springs for an additional source of supply. At the time the application was under consideration your engineer visited the village, and upon going to the springs fround that some of the so-called springs were nothing but surface drainage and absolutely unreliable as a source of supply. He found, however, that three out of the set were good flowing springs, furnishing a very desirable supply of water, both as to quantity and quality. He found also that the present supply of water is contaminated from surface drainage, and recommendations were made to the village for the proper protection of the water against further contamination. The application was granted upon the village agreeing to carry out the recommendation of the Commission.

Application No. 84. Village of Silver Springs. Petition presented August 12th for the right to take water from driven wells to be sunk near the village. This application contemplated the substitution of a municipal plant for one owned by a private water company, which had proved inadequate and unsatisfactory as to the quality of the water. Strong objection was raised by the private Water Company to the granting of the application, but the testimony taken and the physical condition of the private Water Company's plant, as observed by the Commission, was such that the petition of the village was granted.

Application No. 91. Petition presented October 28th, by John A. Drew. This application is from an individual who seeks to engage in the business of supplying water taken from driven wells near the village of White Plains, Westchester county. The water supply of the village of White Plains has failed for two successive years, and the Board of Water Commissioners is now unable to secure an adequate supply from the watershed controlled by them, which fact makes the problem of water supply a very serious one. Mr. Drew, having prospected at his own expense, and discovered what apparently is a supply of wholesome water from underground sources in the flat valley of the Bronx river north of the village of White Plains, then presented his application with a view to entering into a contract with certain villages in the town of Greenburgh and the village of White Plains to supply water in quantities ranging from one million to three million gallons per day. The application has met with objection by certain of the village officers of White Plains.

The most important water supply application claiming the attention of the Commission and your engineer during the year was that of the city of New York, Application No. 67, filed December 16, 1909, for the right to modify or enlarge the plans for the Catskill aqueduct. This application covers in reality that portion of the plans of the Board of Water Supply of New York city, specifically referred to in the original application as being subject to modifications or enlargements after due study had been given to that portion of the proposed work. The plan contemplates the construction of a deep tunnel from the Hill View reservoir through the Borough of Bronx under the Harlem river into Manhattan, from thence down the length of Manhattan Island under the East river into the Borough of Brooklyn. From the terminus of the tunnel in the Borough of Brooklyn, the plan contemplates a system of cast iron pipes under the streets to connect with the existing distributing systems in the Boroughs of Brooklyn and

Queens, and a further extension of the main pipes under the Narrows to the Borough of Richmond on Staten Island, and emptying into a reservoir of 400,000,000 gallons capacity. The estimated cost of this work is $25,000,000, and the tunnel will be capable of delivering 500,000,000 gallons of water per day. Some opposition was raised to the granting of this application, but upon taking the testimony at a succession of hearings, the opposition proved to be not well founded and of little strength. The application was finally granted on October 26, 1910.

The work proposed under the twenty-five applications received during the year 1910 contemplates the expenditure by the applicants of $850,000.00, and the plans contemplate furnishing 9,000,000 gallons of water daily to a combined population of 100,000 persons, which is at the average rate of ninety gallons per capita per day. The combined storage capacities of the reservoirs contemplated by the plans amounts to 512,000,000 gallons.

Many of the municipalities in the State have suffered a shortage in their water supply as a result of the extensive drought of the past six months. In some sections of the State the rainfall during the last half of the year has been less than fifty per cent. of the normal amount. The most seriously affected locality is in Westchester county, as described in a subsequent section of this report.

The time will soon come, if in fact it is not already here, when certain districts of the State in which are situated several thickly settled and growing municipalities, must take active steps to provide against a serious water famine. In such localities the formation of a metropolitan water district would insure an adequate water supply and a just distribution of the same and protect the sources of supply against pollution.

The purpose of creating a Metropolitan Water and Sewerage District is to establish a legal organization as a unit for a combination of two or more adjacent incorporated municipalities, in order to make possible the creation of a common water supply system and a sewage disposal system for the entire district. The district as a whole becomes surety for such bonds as may be issued to raise the necessary funds for the construction of the water and sewerage systems. In such a district each individual municipality retains its corporate identity and upon the completion of the water supply or sewerage system each receives its proportional share of benefit from such system and pays therefor its proportional share of the cost. To each municipality is delivered its share of the water at wholesale, the distribution of which within its limits is under the jurisdiction of its local officers and the interior sewers may be constructed and maintained by the municipality which they serve.

The management of a Metropolitan District is usually put in the hands of a district commission appointed by the Governor of the State, and all construction work is done by this Commission. The Commission has the supervision over the distribution of the water supply, the construction and regulation of trunk sewers and the final disposal of the sewage, and to it each municipality pays its proportion for the water and sewerage service received.

By the Metropolitan plan several municipalities are assured a larger supply of water and a more comprehensive system of sewage disposal at a lower cost than would be possible were each municipality to undertake an independent development. The work being done as a whole and charged to the several municipalities is more economically accomplished and is to the mutual advantage of all municipalities composing the Metropolitan District.

In the experience of other states it has been found advantageous to combine the water supply and sewerage disposal under one Commission, as these two public works are so closely related they should naturally be considered together.

A Metropolitan Water District such as has been described was established by the State of Massachusetts in 1895 to provide a supply of pure and wholesome water for the city of Boston and the adjoining cities and towns, and the work was intrusted to a Metropolitan Water Board. Six years later the board was consolidated with the Metropolitan Sewerage Board, which had theretofore been created for the purpose of providing adequate sewerage facilities for the same district. Other states have instituted the same system as Massachusetts, notably California, where unusual powers are given to the Metropolitan Water Boards.

WESTCHESTER COUNTY WATER SUPPLY.

The exceptionally dry weather of the present year preceded by two successive dry years has emphasized the advisability of some definite immediate action being taken to provide an adequate system of water supply for the municipalities in Westchester county, especially in the southern section adjacent to the city of Greater New York. Improved transportation, and the rapid growth of the city of New York, have given an impetus to the growth in all of that territory, and its population is increasing so rapidly that many of the present water supplies are inadequate to meet the demands in the summer months and others will have been outgrown within five or ten years. This rapid increase in population not only increases the demand for the water but increases the necessity for filtering all of the water taken from surface sources in Westchester county. The growing importance of water supplies for the urban population of Westchester county has been emphasized in the hearings before this Commission upon the applications of the villages of Ossining, White Plains and Croton-on-Hudson and the Harrison water district.

Previous to October of this year press reports began to take note of an impending water famine in several of the cities and villages in the county, especially in Yonkers, Mount Vernon and White Plains, and even as early as August, the largest two private water companies supplying several of the municipalities within the territory were compelled to seek aid of the city of New York in supplying their customers.

On October 7th, the Commission passed a resolution directing an investigation to be made of the situation in Westchester county, and on the 27th the President of the Commission, accompanied by the Consulting Engineer and the Division Engineer, started upon such an inspection trip. During this trip, lasting three days, all of the reservoirs of the local water supplies were inspected and the water works officials interviewed in regard to the present and future needs of their respective communities. At that time all of the towns dependent upon the New York Interurban Water Company, furnishing water to Mount Vernon and Mamaroneck, and the Consolidated Water Company of Suburban New York, furnishing North Tarrytown, Dobbs Ferry, Uniontown, Scarsdale, Ardsley, and Hastings, were using water obtained from the Croton supply of New York city. Yonkers had a storage in its reservoirs sufficient for only fifteen days supply, and was drawing about one-half of its daily supply from this source, and was seeking permission to draw from the Croton aqueduct if the necessity arose. White Plains, although on the verge of a water famine, was disputing as to the proper remedy to be applied and was experimenting in an effort to obtain water out of driven wells on its own properties. The village was then obtaining more than half of its daily supply from the Kensico aqueduct of New York city. The New Rochelle Water Company was in fairly good condition and was increasing its storage capacity for the future by enlarging its reservoir on Troublesome brook. The Port Chester Water Company was in fair condition. Although the supply was becoming short and the officials were curtailing the daily use of water they expected to have sufficient to last through the drought. The source of supply is in Connecticut and the water is received at the State line from the Greenwich (Conn.) Water Company. The latter company is preparing for future needs by raising its dam and increasing the storage capacity of the reservoir. At Tarrytown, the reservoir was about one-half full and appeared to have water enough in storage to last the village through the dry period.

The villages of North Tarrytown, Dobbs Ferry, Hastings and Ardsley, being supplied by the Consolidated Water Company, were obtaining practically all of their supply from the Croton aqueduct. The village of Ossining had sufficient water in storage to carry it over the drought provided care was exercised in the matter of consumption. The village of Peekskill was amply supplied and entertained no fear of a famine. However, the water department urged upon the citizens the greatest care to prevent waste and unnecessary use of water.

This inspection showed conclusively that all of the present supplies were being taxed to their limit, and in several most important cases had been practically exhausted, and that some private companies and towns were energetically preparing to provide for future demands while others were depending more or less upon the good will of New York city in sharing its water supply to tide them over the driest seasons.

To remedy the conditions both temporarily and for the future, various suggestions are being put forward in each town, the more important of which are:

(a) Annexation to New York City.
(b) Further development of local sources.
(c) The development of underground sources.
(d) Purchase of water from the city of New York when the Catskill supply becomes available, which will be possible under chapter 724 of the Laws of 1905.
(e) The formation of a Metropolitan Water District to obtain water from some source outside of the county.
(f) The incorporation of a new city consolidating the municipalities in the southern part of the county.

As an instance of projects for the further development of present supplies may be mentioned the proposition of the Consolidated Water Company presented to the city of Yonkers, offering to sell to that city its Pocantico supply. This company proposed to sell to the city of Yonkers for $1,600,000 its plant, which now supplies North Tarrytown, Dobbs Ferry, Hastings, Uniontown, Scarsdale and Ardsley. The company claim that the entire flow of the stream can be stored on the Pocantico watershed, thus giving a low water supply of 12,000,000 gallons per day, but suggested a plan to construct an aqueduct from the watershed to the Grassy Sprain reservoir for storage in the city of Yonkers, and it estimated the cost of the project, including the purchase of the company's rights, at $3,000,000. The company estimated the cost of water delivered in the Grassy Sprain reservoir by this aqueduct at $40 per million gallons. The aqueduct would have to be from eight and one-half miles to nine and one-half miles long to reach the Grassy Sprain basin at the required elevation. All water taken from this reservoir has to be pumped into the city mains. The total supply available under these proposed conditions was estimated at 8,000,000 gallons per day.

Assuming the estimate of the water company to be correct, viz., $3,000,000 for the total cost of the work, and computing interest at 4½ per cent., depreciation, repairs, operation and sinking fund at 2½ per cent., the cost to the city of Yonkers of this water delivered to the Grassy Sprain reservoir would be $71.92 per million gallons, and to this price must be added the cost of pumping into the city distributing system.

In the annual report of the bureau of water of the city of Yonkers for 1909, the average operative cost of pumping for all of the water measured by plunger displacement is given as $18.60 per million gallons. With interest, depreciation and sinking fund allowance at 6 per cent. on the cost of the pumping plant under conditions existing at Yonkers, the total average pumping cost of this water is $25.39 per million gallons, which if added to the estimated cost of water from the proposed Pocantico source makes a gross cost of $97.31 per million gallons. Ultimately considerable additional costs will arise from the protection of the supply from contamination or for filtration at an added cost of about $12 per million gallons. While sales of water to towns now supplied by the Pocantico system might possibly reduce this somewhat (provided the city of Yonkers continued to furnish water to those localities), and might bring the cost down to $90 or $100 per million gallons as an average for high and low service in that city, doubtless this figure would be considerably exceeded.

This case has been set forth thus fully as a fair example of the probable cost of an adequate additional supply from local sources for any of the towns of Westchester county. The water supplied to the cities, villages and private water companies by the city of New York is being paid for at the rate of $133.33 per million gallons, and in addition to this the municipalities and water companies obtaining the water are put to the further expense of pumping into their respective distribution systems and of maintenance.

As an instance of water supply development from underground sources, the situation at White Plains may be cited. In this instance a contract has been entered into by the board of water commissioners with an individual, who at his own expense prospected for and found a good underground supply near the village. The contract contemplates a supply of not less than 1,000,000 gallons daily, derived from driven wells, to be furnished to the village under pressure at $80 per million gallons.

While the city of New York is now furnishing municipalities and water companies in distress at the same rate which is charged smaller consumers in the city, it is doing so purely as a matter of neighborly consideration. There is no legal obligation upon the city to sell its water until the new Catskill aqueduct is completed, at which time any municipality may purchase its supply from the city of New York, but must pay therefor at the same rate as may be charged the citizens of New York City. In the present situation should a question arise as to the sufficiency of New York's supply in storage, or a legal question be raised by some citizen bringing injunction proceedings, it is possible that New York City would be permanently restrained from any further sale of water previous to the completion of the Catskill aqueduct. In fact, New York City is almost certain to require all of her Croton and Kensico supplies for her own use before the Catskill supply becomes available, and doubtless before running any risk of the possibility of a shortage in her own territory, she will cut off the supply now being allowed to neighboring municipalities.

To illustrate the conditions of rainfall during the past few years in Westchester county, and the increase in population and consumption of water, three tables are submitted herewith.

Table I shows the rainfall at points in Westchester county and New York City for the years 1907 to 1910, inclusive. These records show that the rainfall for the year 1908 at the four stations was 14.8 per cent. less than the long term average for the same stations. For 1909 it was 5.0 per cent. less than the average. For the first nine months of 1910 the rainfall has been 28 per cent. less than the long term average for the same nine months at the same stations. It is thus seen that the present year has been a record-breaking one in the matter of dryness in Westchester county, and having been preceded by two more than ordinarily dry years, the severity of the existing water famine is not to be wondered at.

TABLE I.

Rainfall Records for Westchester County and Vicinity.

STATION.	RAINFALL IN INCHES.				
	1907.	1908.	1909.	1910.	Long term average.
Croton watershed	57.30	42.26	51.54	44.14	49.04
Bedford	50.61	39.53	42.06	35.36	48.08
New York City	45.28	41.43	41.55	35.98	44.63
Mount Hope	55.64	40.63	47.69	34.83	50.68
Mean	52.21	40.96	45.71	37.58	48.11
Departure from long term	+4.10	—7.15	—2.40	—10.53	....
Averages	+8.5%	—14.8%	—5.0%	—21.9%	....

Table II shows the monthly rainfall and departures from the long term records for the year 1910 at the same observation stations as are given in Table I.

TABLE II.

Monthly Rainfall Records in Westchester County and Vicinity (1910).

MONTH.	CROTON WATERSHED.		BEDFORD.		NEW YORK CITY.		MOUNT HOPE.	
	Rainfall.	Dept'r.	Rainfall.	Dept'r.	Rainfall.	Dept'r.	Rainfall.	Dept'r.
January	7.20	+3.08	4.32	+0.68	5.61	+1.82	3.20	—0.63
February	5.70	+1.59	3.15	—0.93	4.07	+0.33	2.85	—0.89
March	0.78	—3.46	0.40	—3.24	0.86	—3.24	1.22	—3.09
April	6.59	+3.11	5.20	+1.75	4.53	+1.23	6.05	+1.97
May	3.37	—0.48	3.35	—1.21	1.66	—1.52	4.11	—0.39
June	5.35	+1.77	3.42	—0.13	5.10	+1.84	5.90	+1.97
July	1.23	—3.47	1.48	—3.08	0.23	—4.31	0.79	—4.71
August	2.69	—2.31	2.44	—2.67	2.13	—2.40	1.63	—3.68
September	1.98	—2.26	2.06	—2.11	1.43	—2.16	2.10	—1.84
October	1.62	—2.36	2.34	—1.60	3.79	+0.08	1.25	—3.46
November	4.84	+1.05	5.08	+1.42	4.62	+1.18	*3.58	+0.61
December	2.79	—1.16	2.12	—1.60	1.95	—1.50	*2.15	—1.71
Total	44.14	—4.90	35.36	—12.72	35.98	—8.65	34.83	—15.85

"Dept'r." indicates departure from long term monthly averages.
* Scarsdale records, Mt. Hope record not available.

A study of the rainfall map of New York State submitted herewith, indicates that the area from which the present water supplies for Westchester county are being obtained will yield almost as much water per square mile as the Croton watershed, and in our computation it has been assumed that the yield per square mile will be the same as the Croton yield under the same development of storage reservoirs.

Table III shows the population of the various municipalities in Westchester county using water, the ownership of the water supply, the source of supply, whether filtered or not, and the rates charged for water per million gallons.

TABLE III.

MUNICIPALITY.	POPULATION.				WATER RATES PER MILLION GALLONS.		Water works owned by municipality.	Water filtered.
	1900.	1905.	1910.	Change in five years.	Maximum.	Minimum.		
Cities.				%				
Mt. Vernon	21,228	25,006	30,919	23.6	$300 00	$100 00	No...	Yes.
New Rochelle	14,720	20,479	28,867	40.8	285 00	200 00	No...	No.
Yonkers	47,931	61,716	79,803	29.3	150 00	60 00	Yes..	Yes.
Total	83,879	107,201	139,589	30.2				
Villages (Incor.)								
Ardsley	404	470	537	14.3	300 00	100 00	No...	Yes.
Briar Cliff Manor	*e*350	417	950	128.0	267 38	213 90	Yes..	Yes.
Bronxville	579	994	1,863	87.5	300 00	100 00	No...	....
Dobbs Ferry	2,888	3,515	3,455	—1.7	300 00	100 00	No...	Yes.
Hastings-on-Hudson	2,002	3,060	4,552	48.8	300 00	100 00	No...	No.
Irvington	2,231	2,480	2,319	—6.5	400 00	300 00	Yes..	No.
Larchmont	945	1,760	1,958	11.3	.. ...	......	No...	Yes.
Mamaroneck	4,722	5,090	5,699	12.0	300 00	100 00	No...	Yes.
North Tarrytown	4,241	4,750	5,421	14.1	300 00	100 00	No...	No.
Ossining	7,939	7,135	11,480	60.9	200 00	120 00	Yes..	No.
Pelham	303	349	681	95.2	300 00	100 00	No...	....
Pelham Manor	*e*575	638	852	33.6	285 00	200 00	No...	No.
Pleasantville	1,204	1,585	2,207	39.2	533 33	200 00	Yes...	Yes.
Port Chester	7,440	11,198	12,809	14.5	293 33	161 33	No...	Yes.
Rye	3,000	4,076	3,964	—2.8	293 33	161 33	No...	....
Tarrytown	4,770	5,370	5,600	4.3	400 00	93 33	Yes..	Yes.
Tuckahoe	*e*1,000	1,580	2,722	72.4	300 00	100 00	No...	....
White Plains	7,899	11,579	15,949	37.8	300 00	100 00	Yes..	No.
Total	52,492	66,046	83,018	25.6				
Grand total	136,371	173,247	222,607	28.5				

NOTE.— There is a population estimated at 7,000, not included in the cities and villages in the territory which is now supplied with water from a public supply.

It is estimated that the total number of inhabitants of the district requiring water service in 1915 will be 300,000; 395,000 in 1920 and 525,000 in 1925.

"e;" estimated.

The requirements as to consumption of water by the present population may reasonably be taken at an average of 100 gallons per inhabitant per day. In some municipalities the consumption is more than this average and in some it is less, but this figure is assumed as a fair average for such municipalities as those under consideration. As the population grows, however, the consumption per capita will probably increase and in a few years will reach at least 120 gallons per inhabitant per day. The exceptionally fine opportunities for shipping facilities and manufacturing plants along the shore of the Hudson river and Long Island sound will undoubtedly be recognized by manufacturers, and in the near future large demands for water for manufacturing purposes will have to be met. It is probable also that the present high prices paid for water in the greater part of this district will have to be adjusted and reduced. Some of the contributing causes to the present high prices are:

1. Suburban character of the towns and the consequent length of distributing mains per inhabitant served.
2. The high value of the lands purchased for additional storage capacity or the protection of the purity of the water supply. In one instance $2,500 per acre has been paid recently for such land.
3. The necessity for sufficient income to pay attractive dividends to the stockholders in private water companies.
4. The multiplicity of small plants, each with its independent management and operating force and expense.
5. The necessity for pumping and filtering practically all of the supplies.

It is probable that with a comprehensive plan carefully executed, a very considerable reduction in the selling price of water could be effected which would undoubtedly result in increased consumption, so that in any event any comprehensive plan to be adopted for the supply of the municipalities in Westchester county should provide for a consumption of not less than 120 gallons per inhabitant per day.

A further table is submitted (Table IV), showing the various sources of supply, drainage areas, the capacity of the reservoirs, the storage per square mile of the drainage area, the municipality or places where the water is consumed, the population served, the present yield, capacity of proposed storage, etc. The nearest and most practical sources of additional water supply are also included.

TABLE IV.

WESTCHESTER COUNTY WATER SUPPLIES.

SOURCE.	Present Storage.					Where used.	Present yield per 24 hrs. mil. gal.	Proposed Storage.			Total storage per sq. mile.	Ultimate yield mil. gal. per 24 hrs.	
	Reservoir.	Drain area sq. mile.	Capacity mil. gal.	Per. sq. mile mil. cu. ft.	Owner.			Reservoir.	Drainage area sq. mi.	Capacity mil. gal.			
Byram river.........	Round Hill.....	4.5	1,000	......	Port Chester Water Co...............	Port Chester. Greenwich, Conn.	1.3	....	....	....	....	1.3	In Connecticut increase possible.
Blind creek.........	....	......	....	......	....	....	......	Purchase....... Port Chester....	2.6 4.3	....	....	*1.8 *3.0	Not utilized.
Mamaroneck river...	St. Mary's...... Mamaroneck....	1.1 15.0	 15	....	N. Y. Interurban Water Co.	Mt. Vernon and Mamaroneck...	*0.6 *0.6	Res. "A"....... Res. "B"......	4.0 11.0	500 400	8.3	9.5	
									(included in "B")				
								East Branch....	2.3	....	....	......	White Plains application.
Sheldrake river......	Sheldrake L....	3.2	2 Res., 102.8	4.3	Larchmont Water Co.	Larchmont.....	1.1	....	....	....	....	*2.0	
Tom Payne creek....	Tom Payne.....	1.9	85.	......	N. Y. Interurban Water Co.	Mt. Vernon.....	0.9	....	....	....	....	0.9	
Hutchison creek.....	No. 1.......... No. 2.......... No. 3..........	3.2	271. 49. 125.	18.6	New Rochelle Water Co..............	New Rochelle...	2.7	....	....	....	....	2.7	
	No. 4..........	2.1	10.0	......	N. Y. I. W. Co......	Mt. Vernon.....	0.5	....	....	....	....	0.5	
Bronx river.........	White Plains....	0.4	90	......	White Plains........	White Plains....	See wells.	Fair Ground....	3.4	....	....	......	"Fair Ground" not considered potable water.
Troublesome brook..	Troublesome Br.	1.9	220	......	New Rochelle Water Co..............	New Rochelle...	1.1	....	....	....	....	1.1	

Grassy Sprain	Grassy Sprain	} 4.8	900	......	City of Yonkers	City of Yonkers.	4.5	......	......	......	....	4.5	
Sprain	......							Lower Sprain	1.4	......	....	*1.0	
Sawmill river	Stony Brook	1.3	250	......	Tarrytown	Tarrytown	1.0	......	......	......	....	1.0	
					Yonkers	Yonkers	1.6	......	......	......	....	1.6	Not potable water unless filtered.
Pocantico river	Pocantico	12.0	85	......	Consolidated Water Co. of Suburban N. Y.	N. Tarrytown	2.0	Pocantico	12.0	300	3.33	3.5	L. W. flow 400,000 gal. per 24 hours.
						Dobbs Ferry Hastings Ardsley							
Indian brook	Indian brook	1.33	130	......	Ossining	Ossining	1.2	......	......	......	....	1.2	
	Intermediate	......	17	......	......	......	......	......	......	......	....	......	
Peekskill creek	......	......	36	......	Peekskill	Peekskill	......	......	......	......	....	......	Not included in proposed district.
Wells	......	No. 7	......	......	White Plains	White Plains	0.7	Kensico wells	......	2.0	....	*2.7	
		14	......	......	Yonkers	Yonkers	1.1	......	......	......	....	1.1	
		42	......	......	New Rochelle Water Co.	New Rochelle	1.5	New wells	1.0	......	....	2.5	
					Briarcliff Manor	Briarcliff Manor.	0.1	......	......	......	....	......	
					Total present supply	......	22.5	......	......	......	....	41.9	Total practicable local supply.
Peekskill creek	......	......	......	......	......	......	......	Oscawana L.	4.6	......	....	4.6	
								Wickopee, 1	2.6	......	....	2.6	
								Wickopee, 2	2.7	......	....	2.7	
								Barger Pond	1.8	......	....	1.8	
								Mohigan L.	1.1	......	....	1.1	
Popolopen creek	......	......	......	......	......	......	......	Popolopen	16.0	......	....	16.0	
								Queensboro Br., No. 1	2.2	......	....	2.2	
								Queensboro Br., No. 2	1.9	......	....	1.9	
								Queensboro Br., No. 3	6.0	......	....	6.0	
								Lower Popolopen	3.8	......	....	3.8	

* Assumed.

NOTE.—In the light of the experience of the last three years all yields are probably less than those here given.

While the table of population (Table III) is not as complete as desirable, it indicates that in 1915 a population of 300,000 will have to be provided for. With a consumption of 120 gallons per inhabitant per day, 36,000,000 gallons per day must be provided.

The table of water supplies (Table IV) shows a present low water supply of about 22,500,000 gallons per day. Additional possibilities show a possible increase from local supplies of 19,500,000 gallons per day. Thus if all local supplies considered practicable are developed, 1917 or 1918 will see them all exhausted. We believe we have overestimated local possibilities rather than otherwise.

We are aware that we have left out of consideration some sources that may be considered practicable by others. Conspicuous among these will appear the Sawmill river. The large population on this stream, its sluggish character, and the absence of cheap reservoir sites are all unfavorable to the economical development of this stream as a source of supply of potable water. With the pumping, filtering, high cost of reservoirs and cost of protection and inspection, all contributing to the cost of water supply from this stream, we believe that cheaper supplies may be obtained from more distant sources.

MORE DISTANT AND EXTERIOR SOURCES.

In considering more distant sources of water supply or those exterior to Westchester county, the following facts must not be lost sight of:

1. Before exterior supplies can even with the greatest diligence be made available to the inhabitants of Westchester county, local supplies will have become inadequate.

2. That water from exterior sources can be delivered by gravity under sufficient pressure to preclude the necessity of pumping, and probably under conditions precluding for some time at least the necessity for filtering, and at a cost but little, if any, in excess of the present cost for pumping and filtering.

To secure necessary legislation, make the necessary surveys, maps, plans, specifications and estimates and to secure proper discussion and approval will require from one to two years or more, and to secure the necessary lands and rights, and to construct the works probably three years more.

In support of the belief that water can be furnished under the required pressure, at a price but little in excess of the present cost of pumping and filtering, we offer the example of Yonkers stated previously, and we venture to say that the cost there stated for the service rendered will compare favorably with the cost of similar service anywhere in the proposed district when all items are taken into consideration.

Reference may also be made to the report of the Commission on additional water supply for the city of New York made in 1903, page 53 *et seq.* That Commission investigated the cost of pumping New York city supplies. In the borough of Manhattan, after tests and repairs had been begun, the average cost per million gallons pumped was $0.0627 per foot of elevation. It is assumed that this includes interest and sinking fund charges. In the borough of Queens, a small plant, the cost was $0.24 per million gallons per foot of elevation without any allowance for interest, depreciation or sinking fund. The Commission stated that although the unit cost of pumping in small stations must always greatly exceed that in large stations, the cost at this station is still unnecessarily large. In the borough of Brooklyn pumping from driven wells with 30-foot lift, the cost is $0.27 per million gallons raised 1 foot. At Milburn, with 50-foot lift, the cost is $0.065, at Ridgewood the cost is said to be about $0.05, at Mount Prospect the cost is $0.11. The Commission estimated that for the 30-foot lift from the wells the cost could be reduced to $0.085 per million gallons per foot of elevation by the introduction of electric motors supplied with current from a central station.

For the small isolated plant the cost of pumping cannot be assumed at less than $0.10 per million gallons per foot of elevation under average conditions, and it probably exceeds this figure considerably. Assuming a head of 300 feet as the average against which the water must be pumped in the Westchester county municipalities, this cost alone is $30 per million gallons.

For filtration, the estimated cost of operation given in the same report ("Burr-Herring-Freeman report") for a 250,000,000 daily capacity plant is $8.40 per million gallons and for a 500,000,000 daily capacity plant, $8.10. It is probable that the cost of slow sand filtration for small capacity plants under ordinary management and conditions existing in Westchester county is not less than $12 per million gallons when all proper charges are included.

The cost of pumping and filtering present supplies in Westchester county is probably in excess of $42 per million gallons.

Proceeding now to available more distant or exterior supplies, we have listed two sources, which from the very limited study we have been able to give this branch of the subject appear especially suitable. These are Popolopen creek and its tributaries on the west side of the Hudson river, and some tributaries of Peekskill creek on the east side.

Popolopen creek was considered by Mr. Freeman in 1900 in his report upon New York's water supply, etc., made to Bird S. Coler, comptroller, p. 502. He thought it "a very favorable watershed of its size but too small except as an adjunct to some larger source. The conditions affecting the quality of the water appear most favorable and this promises to be a supply of exceptional purity." He estimated the cost of the reservoirs for storage at $2,422,000. The U. S. G. S. topographic maps covering this territory have become available since Mr. Freeman's report was made. We learn from a study of these maps that the water from an area of nearly twenty square miles could be impounded in a single reservoir of sufficient capacity to control the entire flow, and at an elevation of over 600 feet above sea level. The water from 10 square miles of the area of Queensboro Brook basin could be delivered at elevation 500, and that from 5.6 square miles of the upper areas of the watershed (Queensboro brook (4.1 square miles), and Cedar Pond brook (1.5 square miles) could be delivered at elevation 600. With the unlimited pondages available a yield of one million gallons per square mile per day should be economically secured, or about 25.6 million gallons per day at elevation 600. At elevation 400, about 35 million gallons per day would be available. The watershed of Popolopen creek appears in every way admirably adapted as a collecting ground for water supplies. If it should be used, and completely developed, further supplies can be obtained from various sources in the mountainous district near Peekskill.

There is a particularly promising possibility in the Peekskill

Creek watershed at Oscawana lake and vicinity, where it appears possible to use the lake as a reservoir for about ten square miles of area by turning into it the drainage from the two creeks lying to the north in the vicinity of Wickopee. The storage available appears to be ample to fully control the flow so that a further supply of 10,000,000 gallons per day at elevation 550 should be available. The further possibilities of this region are very great.

These supplies at elevation 550 or over, amounting to 35,000,000 gallons per day, should be sufficient to last until 1925 when taken in connection with local supplies fully developed. As to their cost, we hesitate at giving an estimate with so little data on which to found our judgment, but if it be understood that it is an approximate estimate only we hazard the figure of $7,500,000, or $41.10 per million gallons reckoning interest at 4½ per cent., depreciation, sinking fund and repairs at 2 per cent., and operation at $37,500 per annum. We have estimated that these supplies could be delivered at an elevation of about 400 feet above sea level.

The time at our disposal for the investigation of this subject has been too short to collect the facts as fully and carefully as the importance of the subject deserves. It is clear, however, that the situation in Westchester county is extremely serious and is only saved from being desperate by the good nature and humanity of the New York City officials. How long this good nature may be depended upon or how long New York City will be permitted to share its water supply is a problem for the solution of which the people of Westchester county cannot afford to wait.

It is clear, therefore, that:

1. There should be immediate and concerted action on the part of the Westchester county municipalities to secure temporary relief, and

2. There should be immediate and concerted action to secure adequate future supplies. To this end private water companies operating in this territory should be compelled to develop their territory to the extent necessary to furnish to their customers the ample supplies called for by their charters, and in case this does not completely utilize all the water furnished by the watersheds on which their works are located, then storage of flood waters by other companies or municipalities must be permitted.

3. The various municipalities and water companies must be united through some agency to secure concerted action.

4. The questions of methods and policies to be pursued must be settled as soon as possible.

For the reasons which have been set forth above, the enactment of a law or laws is recommended as follows:

1. Providing for the creation of a metropolitan water and sewerage district composed of all that part of Westchester county lying south of the towns of New Castle and North Castle, subject to confirmation by a vote of the inhabitants thereof and conferring upon the State Water Supply Commission power for the distribution of local sources of water supply and directing their development. In such a metropolitan district the individual municipalities will not lose their identity.

2. Providing for a special election at which the following questions shall be submitted to the voters of said metropolitan water and sewerage district:

(a) Shall the territory comprising said district be formed into a metropolitan water and sewerage district, and in the event that question " a " is decided in the affirmative, then

(b) Shall the said district spend, under the direction of the State Water Supply Commission, $50,000 in making surveys and preparing maps, plans, specifications and estimates for additional water supplies, said maps, plans, specifications and estimates, together with a law making an appropriation for construction and fixing the method of distribution of costs, to be submitted to a further vote for approval before construction is authorized.

RIVER IMPROVEMENT.

Canaseraga Creek. At the close of the year, 1909, the resurvey of the Canaseraga Improvement District had been completed, together with the maps and descriptions of the numerous parcels composing the district, and surveys for the establishment of a boundary line of the improvement district. Upon the completion of the maps and descriptions of the improvement district, the same were filed in the office of the clerk of Livingston county, on January 12, 1910, and pursuant to due notice thereof being given, six hearings were held in Geneseo and in the village of Mount Morris between February 9th and April 15th, at which all persons interested were given an opportunity to be heard either for or against the establishment of the proposed boundaries and extent of the district. Final action was taxen by the Commission on April 15th, establishing the boundaries of the improvement district, as shown on the map filed, and upon which the hearings had been held. Shortly after this proceeding was had, the bonds for the improvement district were offered for sale, and on July 1st a satisfactory bid was received, resulting in the sale of $200,000 worth of bonds at a premium. Some little delay followed the acceptance of the bid for the bonds, while the attorneys for the purchaser examined into the legality and security of the bonds. On September 12, 1910, the proceeds from the bond sale being in hand, the necessary supplemental contract with DeWitt C. Stephens, assignee of the firm of Graves & Stephens, was executed by the Commission and the contractor, and orders were given him to proceed immediately with the construction of the proposed improvement. On the 10th of September an engineering party was sent to the Canaseraga creek, with headquarters at Dansville, and surveys started for the final location of the cut-offs and for the necessary rights of way for the improvement of the creek. At this date, the main creek and the proposed cut-offs have been cross-sectioned, and working estimates prepared over the entire length of the proposed improvement. Right of way maps and descriptions have been prepared covering practically all of the work to be done between North Dansville and the Groveland road, including the State and west ditches and Bradner creek.

Upon written request of the contractor, permission has been granted him to sublet the dredging on the main creek and cut-offs, and certain other items in his contract relating to the construction of bridges, pile driving and timber crib work. The subcontracts have been let to two parties in the hope that the work would thereby be expedited and that actual construction work might be started before the winter season. The Brookville Bridge Company, Brookville, Ohio, has the bridge and concrete subcontract and Forestal & Downing, Milwaukee, have the dredging. At this date the contractor has one dredge on the ground and is erecting it to begin work on the main creek channel immediately north of the Dansville and Mt. Morris railroad bridge.

Genesee River Improvement.— The maps, plans, lists, specifications and other papers required under section 12 of the State Boards and Commissions Law have been prepared for filing, in the matter of the application of the supervisors of the county of Monroe for the regulation of the Genesee river under the River Improvement act and were approved by you on December 1, 1910. The basis upon which these maps, plans, and lists have been prepared is the construction of a high masonry dam on the Genesee river at the "Rafter site" above the upper Portage Falls, which will form the socalled Portage reservoir, and impound 13,000,000,000 cubic feet of water to elevation 1,198, and provide for an additional storage of 6,000,000,000 cubic feet for flood control, with a flood flow line at elevation 1,215. The properties below the dam which in the judgment of your engineer, will receive a benefit from this improvement, includes the farm lands in the bottom of the gorge between Portage and Mount Morris, the lands in the Canaseraga valley south of the Erie Railroad, which lie below elevation 570, and all of the lands in the valley of the Genesee between Mount Morris and the Upper Falls in the city of Rochester which have been heretofore subject to damage by the floods which occur almost annually in the river. The maps, plans, etc., prepared in this connection are as follows:

1. A general map of the Genesee river from Lake Ontario to the south end of the proposed Portage reservoir in the town of Canadea, Allegany county. The map shows the location of the Genesee river, the territory to be included in the Portage reservoir, the territory subject to floods between the falls in the city of Rochester, and the falls at Portage, including the portion of the Canaseraga creek valley which is affected by the Genesee river

floods. The map also shows the several boundary lines between counties and towns, the location of the city of Rochester and the several villages situated in the vicinity of the river.

2. A set of maps covering the entire territory to be included in the Portage reservoir behind a dam constructed on the so-called Rafter site above the upper Portage Falls. These maps show in detail every farm in the territory, the village lots, the right-of-way of the Pennsylvania railroad, the highways, buildings, and the topographic details.

3. A set of plans of the Portage dam, including a plan, elevation and cross sections of the dam and spillway.

4. A map and profile of the proposed relocation of the Pennsylvania Railroad.

5. A map of the Portage reservoir and vicinity showing the proposed changes in the location of highway affected by the improvement.

The papers and lists prepared in this matter are as follows:

1. A list of the counties, towns, cities and villages to be benefited by the proposed improvement.

2. A list of the railroads, corporations and individual property owners in the valley of the Genesee and Canaseraga creek below Portage whose lands will be benefited by the proposed improvement.

3. A general specification of the proposed improvement in sufficient detail to briefly but clearly explain the maps and plans and the nature and details of the proposed improvement. These specifications do not necessarily go into the details of specifying the materials which will enter into the construction of the Portage dam, the change of the Pennsylvania Railroad, etc., nor are they such specifications as would be required for a contract, but they are in sufficient detail to afford a clear understanding of the nature and extent of the proposed improvement.

4. A detailed estimate of the cost of the proposed improvement including the cost of the Portage dam and spillway with their appurtenances; the cost of land to be acquired for the reservoir, and the change of highways and the Pennsylvania Railroad; the cost of reconstructing the highways, including the bridges; the cost of reconstructing the Pennsylvania Railroad, including bridges and completed track, and all other expense incidental to the execution of the plans.

5. A report and tentative plan for the apportionment of the cost of the improvement upon the counties, towns, cities, villages and individuals receiving a benefit therefrom.

The above-mentioned maps, plans and papers were filed in the offices of the County Clerks of Monroe, Livingston, Allegany and Wyoming counties, on December 15th and 16th, 1910, and a date set for a hearing in the matter at Rochester on February 2nd, 1911.

Your Engineer still believes, as pointed out in his previous reports that the regulation of the Genesee river for the protection of the public health and safety alone, by the construction of the Portage reservoir, is not a feasible or practical plan, for the reason that the high cost of such a reservoir is greater than the value of the lands and other properties benefited will warrant when protection from flood damage alone is considered. In his judgment, the only feasible and economical basis upon which the Portage reservoir can be built, is that of combined flood control and power and with a power development made at Portage. However, he fully realizes the situation urged upon the Commission by the parties interested in having proceedings taken under the River Improvement act for the proposed Genesee river improvement and believes that by taking such proceedings the whole matter in all its phases will be officially considered and advanced.

Hudson River Improvement.

Petitions for the regulation of the Hudson river and its tributaries under the River Improvement Act, were filed with the Commission on the 17th day of December, 1909, such petitions being from the following:— (1) The City of Albany; (2) the town of Queensbury, county of Warren, in which town Glens Falls is situated; (3) the employees of the West Virginia Pulp & Paper Company at Mechanicville, Saratoga county; (4) the residents and business men of Mechanicville; (5) The International Paper Co., the Union Bag & Paper Co., The Iroquois Pulp & Paper Co., West Virginia Pulp & Paper Co., Hudson River Power Co., the Hudson Valley R. R. Co., and the Finch & Pruyn Company, all praying for the same relief from the irregular flow of the Hudson river and the damage caused thereby.

These petitions were held under consideration from the date of their presentation until the 17th day of November, 1910, when the Commission, after hearing arguments by the petitioners, duly determined that the relief prayed for should be granted, and directed your engineer to prepare the necessary preliminary maps, plans, surveys, estimates, lists, etc., as required by the River Improvement law.

The surveys, maps and plans which have been made in connection with the water power and water storage investigations during the past three years are all applicable to the consideration of the improvement of the Hudson river, but they are far from being adequate for a full study of the matter as they cover only a small portion of the data which will be necessary before a comprehensive plan can be prepared for the regulation of the river. The reservoirs proposed in the reports on the investigations for water storage, will control only about one-fifth of the total watershed of the Hudson river above Troy. No complete surveys have been made along the shores of the Hudson river below Hadley for the purpose of locating cities, towns, villages and individual property, and manufacturing plants which are damaged by the unregulated flow of the Hudson river and are to be benefited by the proposed improvement, nor have any surveys been made below the city of Albany to determine the causes for the formation of ice gorges, which is one of the important elements in the consideration of the flood damage between the cities of Troy and Hudson.

Studies are being made and data collected and maps prepared in the matter of the Hudson river regulation in compliance with your directions.

Raquette River Improvement.

In the matter of the application of the Board of Trustees of the village of Tupper Lake,, in which case a petition was presented on July 19, 1909, contemplating the construction of a dam at Setting Pole Rapids in the Raquette river for the purpose of controlling the level of water in Raquette pond, no material progress has been made during the year except that the people behind the project represented by Mr. James L. Jacobs of the Tupper Lake Board of Trade, succeeded in arriving at tentative agreement with Mr. Edward H. Litchfield, for a modification of the injunction obtained by him several years ago prohibiting raising the dam at

Setting Pole Rapids and flooding his lands on the shores of Tupper lake and Raquette pond. A draft of the proposed stipulation for the modification of the Litchfield injunction was submitted to the Commission for its consideration on July 16, 1910. The matter being submitted to your engineer for his report was returned to Tupper lake with suggestions as to its modification and additional provisions, which in our judgment should be incorporated in the stipulation in order to make the plan more feasible. Nothing has developed since that date, and we are without further information as to the success of the village of Tupper Lake in raising the necessary funds for the construction of the dam.

WATER STORAGE AND WATER POWER.

In conformity with a tentative plan of the work of the Engineering Bureau for the season of 1910, submitted by your Consulting engineer under date of April 11, 1910, it was directed that the energies and attention of the bureau should be devoted to the following:

(a) Making a study of the power and storage possibilities on the Oswego-Seneca rivers with their tributaries, including the Finger lakes.

(b) Surveys of reservoir sites on the Black river at the points referred to in the reconnaissance reports of 1909.

(c) A complete power survey on the Hudson river from Hadley to Troy.

(d) A power survey on the Genesee river at Mount Morris and Rochester.

(e) Continuation of the hydrographic studies, including the maintenance of the stream gaging and rainfall observation stations heretofore established and the establishment of such additional stations as should be from time to time decided necessary.

As soon as the money from the appropriation for these purposes was available, field and office parties were organized and the work undertaken as rapidly as men qualified for the work could be secured from the civil service lists.

Oswego River.

In the fourth annual report it was pointed out that owing to the fact that about one tenth of the drainage area of the Oswego river is water surface and swamp the river has a flow naturally regulated to a greater extent than any other stream in the state, and that it is also naturally endowed with storage possibilities for further regulation. These natural possibilities have, however, been rendered impracticable to a great extent by the location of cities and towns on the shores of the lakes down to the water's edge and by the use of the lakes for navigation. These artificial obstacles in the way of regulation have grown to such importance that taken in connection with the comparatively low heads available on the Osewgo river proper, it is not practicable to take advantage of the natural storage possibilities except within very narrow limits. Within these narrow limits considerable results may be achieved at remarkably low cost when taken in connection with the barge canal construction.

During the year office studies have been made and data collected on the Oswego river by Mr. A. H. Perkins, Division Engineer, and several reconnaissance trips have been made to study the storage possibilities on certain of the finger lakes. Access has been had to the Barge canal plans which have been studied so far as they relate to this river.

Table V shows in condensed form the amount of practicable storage on the various lakes in the Oswego river basin and shows the elevation between which the lake surfaces will fluctuate, as proposed by the present Barge canal. The table shows also what storage is considered practicable in addition to that contemplated by the Barge canal plans, and the power benefits to be derived from storage alone aggregating 12,188 horsepower years; which means that the stored water alone when used under the heads available below the several storage basins would be sufficient to develop 12,188 horsepower continuously twenty-four hours per day for each day in every year. That would be ideal regulation, but of course the water can not be used in this way but must be used in conjunction with the naturally low water flow during the dry period of each year at a rate two or three times as great as if used continuously and upon wheels which would otherwise be idle. The power owners on the stream will not be required to make any further expenditures for plant to take advantage of the possible power from the stored water.

TABLE V.

PRACTICAL STORAGE ON THE FINGER LAKES, OSWEGO RIVER BASIN.

LAKE.	Drainage area.	Area of water surface.	Notes.	PRESENT PLANS OF BARGE CANAL.						PROPOSED BY STATE WATER SUPPLY COMMISSION.			WITHIN THE PRESENT WATER-WHEEL CAPACITY.	
				Maximum elevation to be permitted.	Lowest winter stage.	Highest navigation stage.	Lowest navigation stage.	Storage for summer regulation.	Storage for winter regulation.	Maximum water surface.	Minimum navigation.	Storage possible.	Available fall below storage.	Power from total storage.
	Sq. miles	*Sq. miles.*		*Elev.*	*Elev.*	*Elev.*	*Elev.*	*Billion cu. ft.*	*Billion cu. ft.*	*Elev.*	*Elev.*	*Billion cu. ft.*	*Feet.*	*H. P. years.*
Oneida	1,265	80.0	Barge Canal should have authority to control for power	‡374.4	*369.4	369.4	369.4	0.000	0.000	374.4	¶369.4	11.00	110	3,490
Skeneateles	73	12.8	Syracuse water supply source	......	......	......	......	......	......	......	......	......	......	......
Owasco	208	12.4	Used at present for storage for Erie Canal	†705.9	†704.9	†708.4	†704.9	†1,210	0.000	715.0	704.9	3.46	350	3,491
Cayuga	886	66.8	To be controlled by Barge Canal	387.0	380.0	*384.0	381.5	4.656	*a*2.793	384.0	380.0	......	121	1,624
Seneca	707	66.0	To be controlled by Barge Canal	449.0	444.5	*447.0	445.0	3.680	*a*.931	447.0	444.5	......	180	1,910
Keuka	187	20.3	Now completely controlled	......	......	......	......	......	......	......	......	......	......	......
Onondaga	233	4.0	Too small to use for storage	......	......	......	......	......	......	......	......	......	......	......
Canandaigua	175	18.6	Little present control by village	†687.7	†682.0	†685.2	......	†1.000	......	687.0	684.0	2.00	290	1,673
Total added power, horse-power-years				......	......	......	......	......	......	......	......	......	......	12,188

¶ The lake could be further drawn to elev. 366.4 for winter use, giving 6 bill. cu. ft.
‡ Flood stage temporary only.
† Estimated.
* Elevation of spillway crest.
a Owing to the natural regulation of the Oswego, storage is very rarely useful after the middle of December.

A very happy mean was apparently reached in the cases of Cayuga and Seneca lakes, through a hearing on the subject of the proposed lake levels, held on August 4, 1910, by the canal Advisory board of consulting engineers, and thereby a long standing antagonism between the water power owners on the Oswego river and the people of the cities of Ithaca, Watkins and Geneva seems in a fair way of settlement. Under the plan, as now proposed, it may be expected that the power owners will get considerable storage to help out the low water flows, and the cities along the shores of the lakes will get considerable aid in the solution of their flood problems.

The Barge canal plans contemplate drawing from the lakes during the low water periods of the navigation season, by means of large sluice gates at the outlets, by which the volume of water in the lakes between the levels of the maximum and minimum navigation stages will be utilized. This will yield from Cayuga and Seneca lakes alone 8.3 billion cubic feet of storage available during the navigation season and 3.3 billion cubic feet additional after the close of navigation.

On Keuka lake practically the entire run-off of the watershed is now conserved, as very little water ever flows over the spillway of the dam at the outlet of the lake. In some years there is no water wasted at all. Any further useful results from the water could only be obtained by interference with private water rights. The mill at the foot of the lake uses the water as it desires, and those mills on the stream below have to use it as it comes from the tailrace of the upper mill, or let it pass by unused. It is probable that some economies could be secured through a union of all of the power users on the stream by an electric development system, but such a union is clearly a matter of private enterprise.

Skaneateles lake is the source of water supply for the city of Syracuse, and it is not deemed desirable to attempt to use the lake for storage for water power purposes, even were it practicable of accomplishment, lest it might conflict with these other water rights.

Otisco lake is too small both as to drainage area and as to water surface to be of much consequence in the regulation of the Oswego river.

Owasco lake is used as a feeder for the Erie canal and as a source of water supply for the city of Auburn. The lake level is now regulated by a State dam and gates at the outlet. Under a court decision the outlet works must be so operated as to never cause a depth of water of more than thirty inches on the crest of the dam. Mr. J. Walter Ackerman, superintendent of the water works of the city of Auburn, states that he has observed the lands at the head of the lake flooded to the tops of the fences at a time when only thirty inches of water was flowing over the crest of the outlet dam, and at another time the same lands were free from flood water when fifty inches of water was flowing over the crest of the dam. From these facts he argues that the flooding of the lands at the head of the lake is not due to high lake levels, but to insufficient capacity of the inlet channel below the flooded lands. The lands affected by the fifty-inch rise of level are about five hundred acres in extent and are said to be of comparatively small value. It is possible that a rise of fifty inches above the crest of the State dam could be affected on Owasco lake without causing very heavy land damages. The many important industries on the Owasco lake outlet makes further accurate field investigations of the possibilities of storage on this lake very desirable.

Onondaga lake is too small in area of water surface to afford much opportunity for storage, and such storage as might be obtained would be at the expense of damage to property of considerable value on the lake shore.

Canandaigua lake is now regulated to some extent by the village of Canandaigua for the purpose of diluting its sewerage, which is discharged into the outlet. The village maintains a flow of about forty cubic feet per second through regulating gates at the foot of the lake. An examination of the conditions on this lake leads to the conclusion that about three billion cubic feet of storage is practicable above the present sill of the gates at the outlet and at a comparatively small cost. With this storage it is estimated a minimum regulated flow of 190 cubic feet per second could be maintained. This situation is worthy of more .detailed surveys and studies.

The Barge canal has constructed a dam at Caughdenoy for controlling the level of Oneida lake, the crest of which is at elevation 369.4. No provisions for maintaining higher water level have been made, except for the use of flash boards, nor has provision been made for drawing off the water in case flash boards are used, nor is there any provision for drawing off the water below the crest of the dam after the close of navigation. Under the Barge Canal Law, controlling works for the purpose of power benefits are not permitted. A lock in the old canal leading out of the lake could be made serviceable for drawing off surplus water by the expenditure of a comparatively small amount of money.

If a movable crest could be arranged on the Caughdenoy dam to hold back the flood water to five feet above the present crest and at the same time never allow floods to rise above that stage, eleven billion cubic feet of storage could be made available during the navigation season. Such a project appears feasible and well worthy of further surveys and study.

Benefits of Storage. In order to show the benefits to accrue from storage to each locality on the Oswego river, the following estimates have been made:

The total fall in the Oswego river from Three Rivers to Lake Ontario is 118.6 feet. With the new dams under construction by the Barge canal at Phoenix, Fulton and Oswego and the construction of the long tailraces recently projected or finished by the power owners, practically this entire head will be made available. On this head the entire volume of storage available during the navigation season will be used each year and occasionally some of the volume available after the close of navigation will be used and these uses will all be within the wheel capacities of the present water power installations. Taking the total planned and proposed additional storage available before the close of navigation as 25,000,000,000 cubic feet and the net head as 110 feet, the possible power development from the storage, on the Oswego river proper would be equivalent to 8,000 horse power at 80 per cent. efficiency, running continuously 24 hours per day for one year, or 8,000 horse power years.

On the head of 229 feet available on Owasco outlet between the lake and its junction with the Seneca river, the 3.46 billion cubic feet of stored water would develop 2,346 horse power years at 80 per cent. efficiency of the hydraulic machinery.

The total fall on the Seneca river is about 71 feet, all of which is now developed. On the 11 foot fall at Baldwinsville there will be available the storage from lakes Cayuga, Seneca, Owasco and Canandaigua, amounting to 10.5 billion cubic feet and this will produce the equivalent of 336 horse power years.

On the 60-foot fall in Seneca river, the 3.5 billion cubic feet of storage would produce 600 horse power years, but the water to be used by the new canal, which will probably be somewhat greater in quantity than that used by the present canal, will reduce this amount.

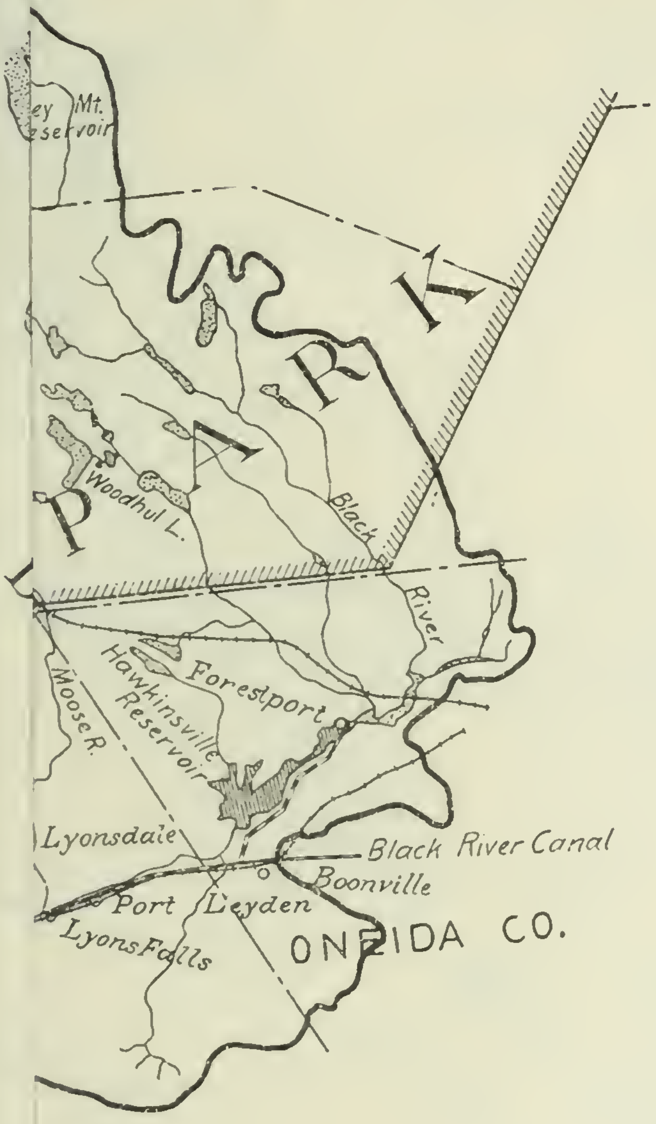
On the 169-foot of available fall in the Canadaigua outlet 2,000,000,000 cubic feet of storage would produce 975 horse power years.

Total power value on the Oswego river system of storage planned for the Barge canal and the proposed additional storage is practically 12,200 horse power years.

Other Canal Waters.—In considering the Oswego river water power situation, the fact should not be overlooked that all the waters used in the Barge canal coming from the west and one-half of all that are used to furnish the canal at the Rome level must pass down the Oswego river. Thus one-half the waters from the great Hinckley and the Delta reservoirs and all the waters coming from Lake Erie on the west will be necessarily discharged into the Oswego river, because the crossing of this valley is at the lowest level of the canal between Lake Erie and Rome. This water will materially increase the summer flow of the Oswego river and will, of course, be additional to anything accounted for in Table V as coming from the storage in the Oswego watershed. As the traffic on the Oswego canal can hardly be expected to equal the combined traffic on the main canal east and west from Syracuse, much of the canal water will be available for power production.

BLACK RIVER.

During the summer of 1909 reconnaissances were made on the Black river watershed and reported upon in the Fifth Annual Report of the Commission. In accordance with the recommendations then made, surveys of the two most important reservoir sites were made during the season just past. On the fifth of July two parties of engineers under the direction of Mr. Russell Suter,



OF NEW YORK
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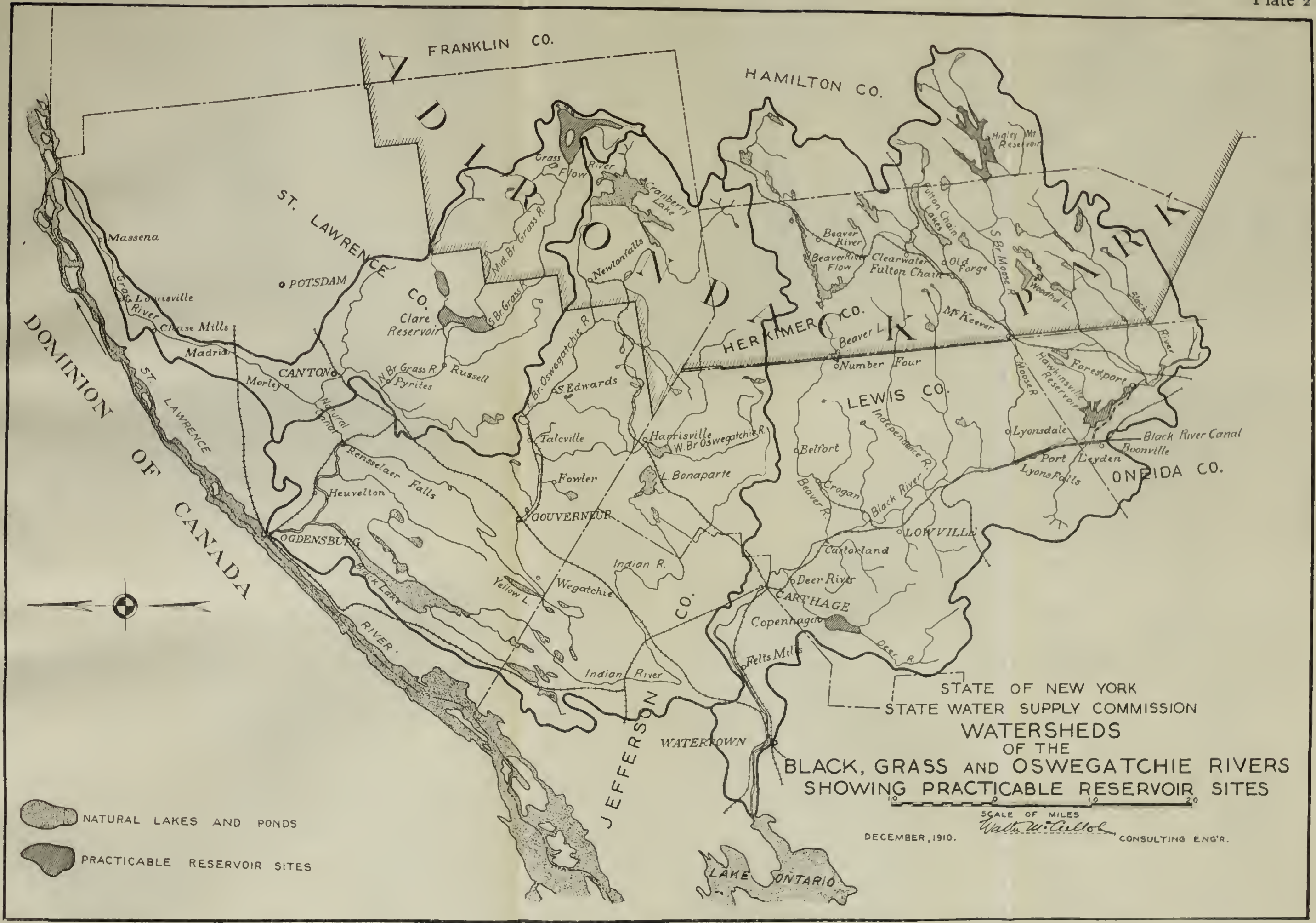


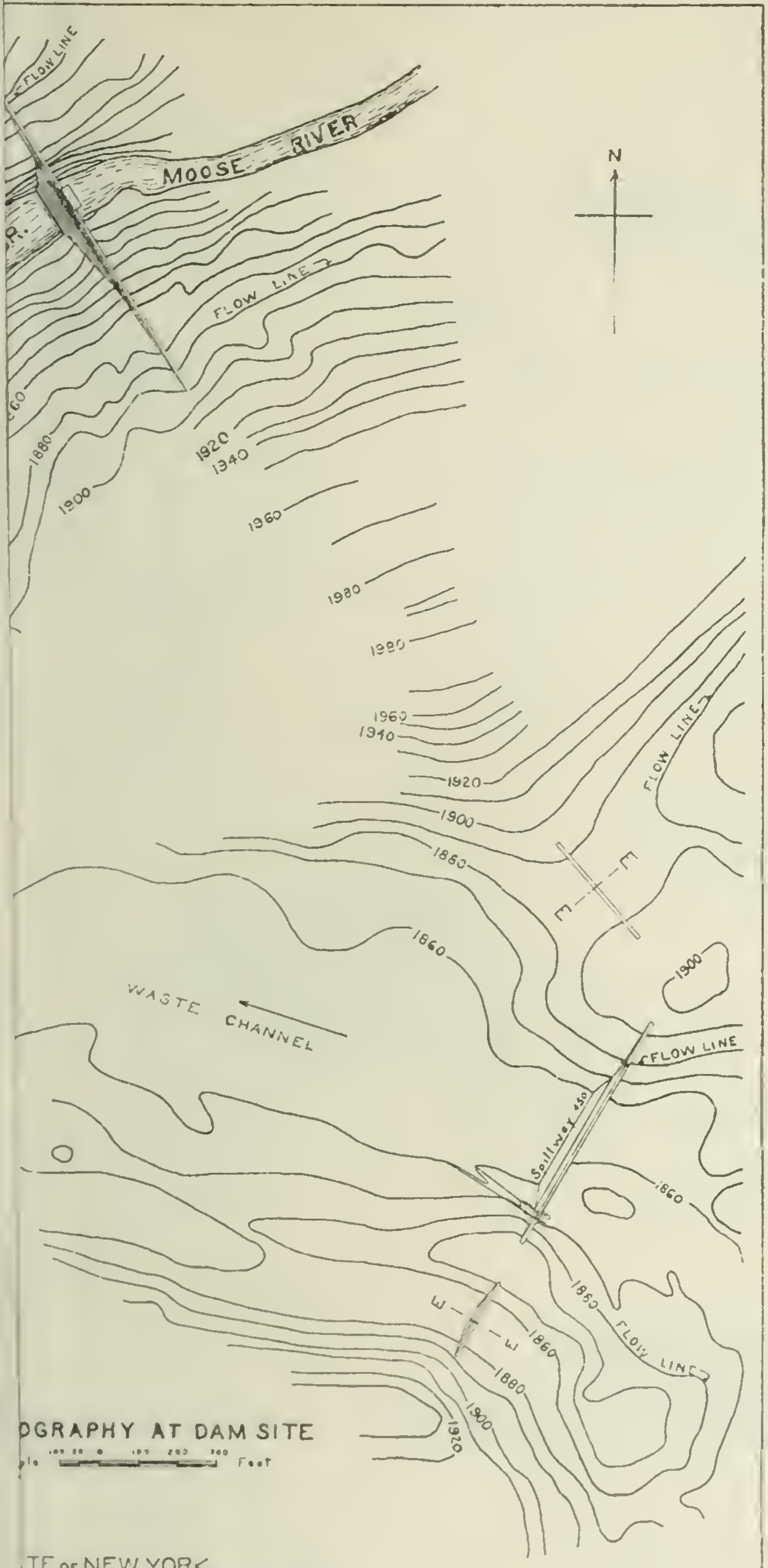
STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION

WATERSHEDS
OF THE
BLACK, GRASS AND OSWEGATCHIE RIVERS
SHOWING PRACTICABLE RESERVOIR SITES

DECEMBER, 1910.

Walter McCulloh CONSULTING ENG'R.

Plate 4



TE or NEW YORK

R SUPPLY COMMISSION

ORAGE AND POWER STUDIES

IGLEY MOUNTAIN RESERVOIR

20 40 60 80

Scale of Feet

Perkins DIVISION ENGINEER

McCulloh CONSULTING ENGINEER

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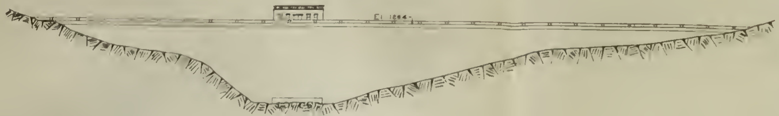
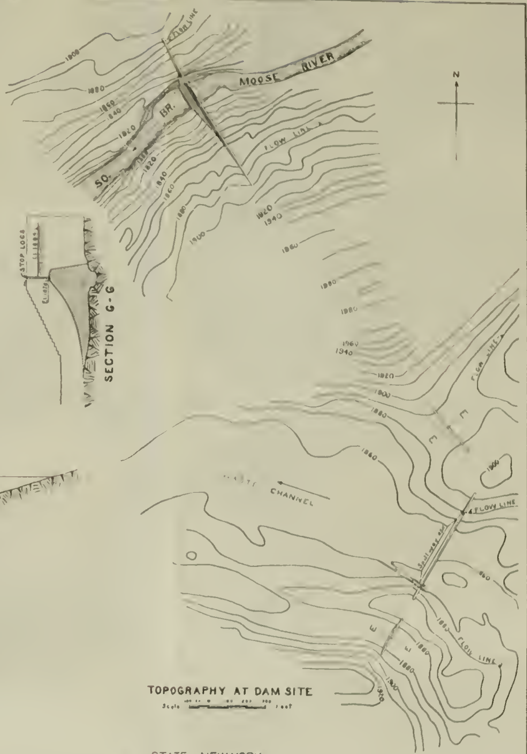


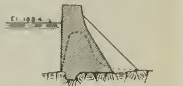
DOWNSTREAM FACE OF MAIN DAM

Scale feet

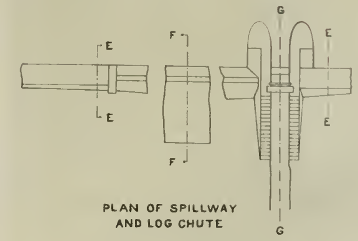


TOPOGRAPHY AT DAM SITE

Scale feet



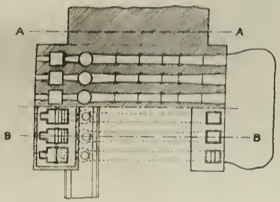
SECTION E-E
TYPICAL



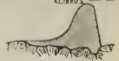
PLAN OF SPILLWAY
AND LOG CHUTE

SECTION G-G

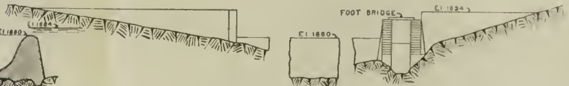
SECTION D-D



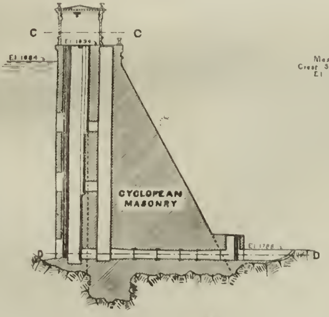
SECTION C-C



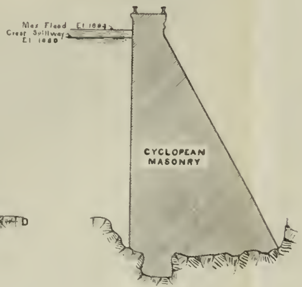
SECTION F-F



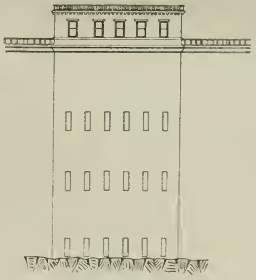
DOWNSTREAM FACE OF SPILLWAY
AND LOG CHUTE



SECTION B-B



SECTION A-A



UPSTREAM FACE OF GATE CHAMBER

STATE of NEW YORK
STATE WATER SUPPLY COMMISSION

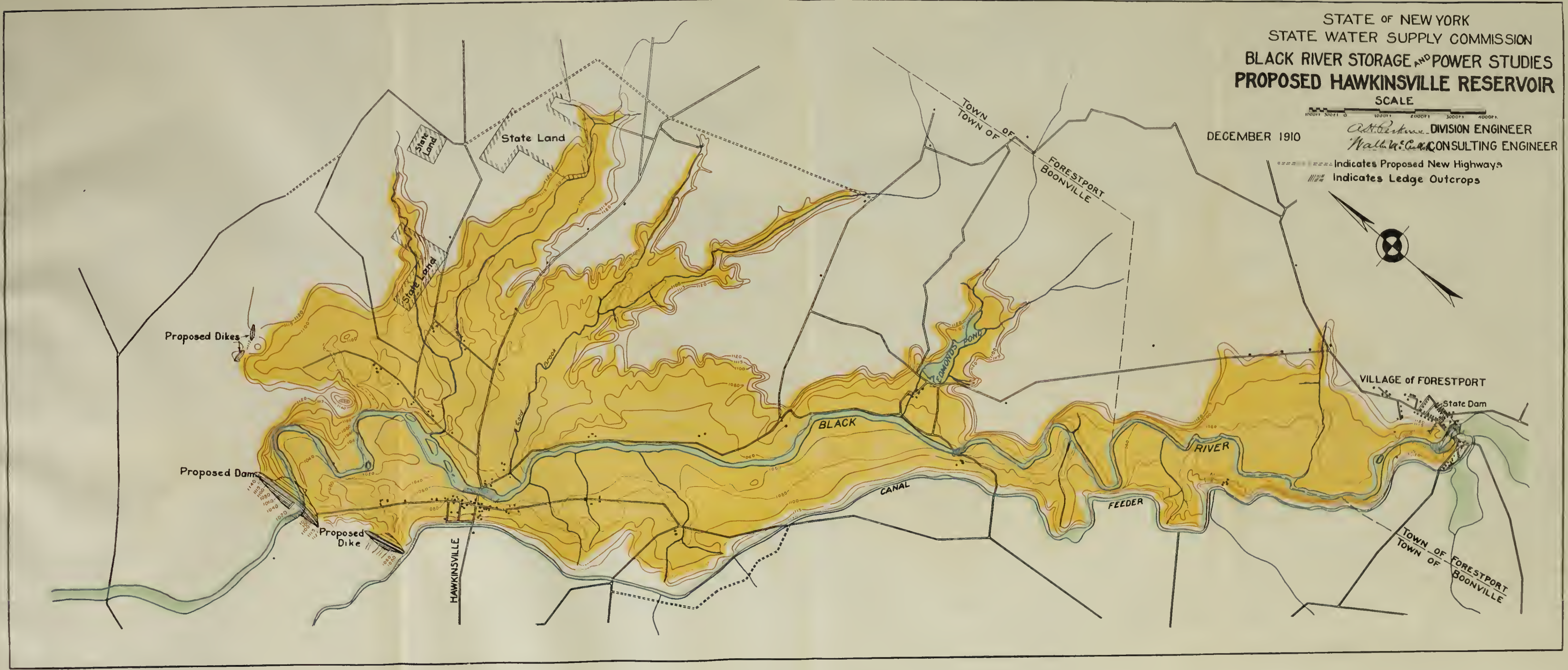
BLACK RIVER STORAGE AND POWER STUDIES
PROPOSED DAM—HIGLEY MOUNTAIN RESERVOIR

Scale of Feet

DECEMBER 1910

A S Perkins DIVISION ENGINEER
Walter McCulloh CONSULTING ENGINEER

Note, These drawings are not to be considered as final designs. They are preliminary studies for determining feasibility and probable cost

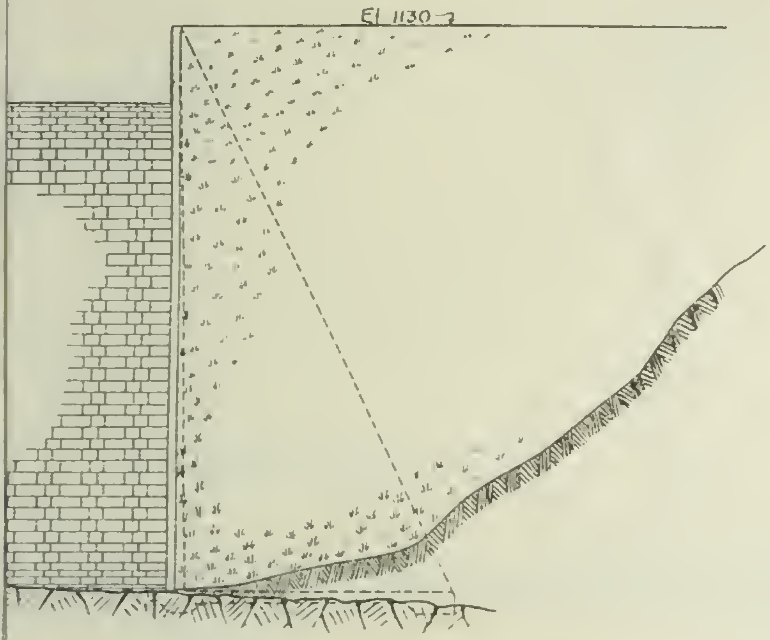


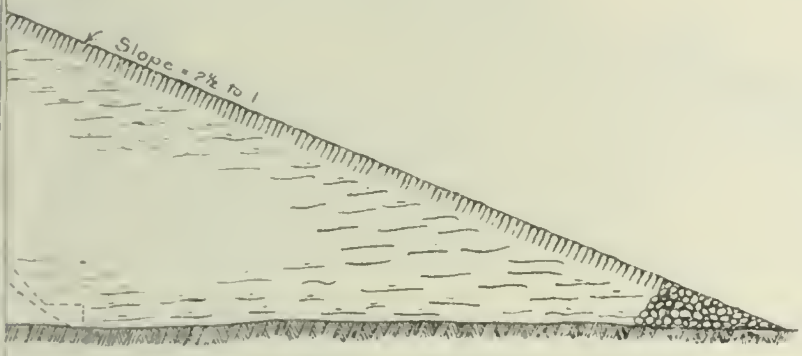
STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION
BLACK RIVER STORAGE AND POWER STUDIES
PROPOSED HAWKINSVILLE RESERVOIR

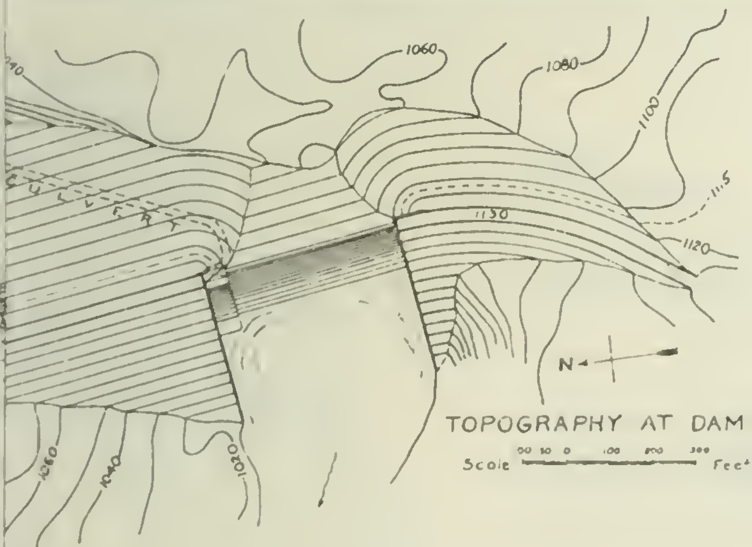
DECEMBER 1910

A.H. Perkins DIVISION ENGINEER
Walter McCulloh CONSULTING ENGINEER

Plate 6







TOPOGRAPHY AT DAM SITE

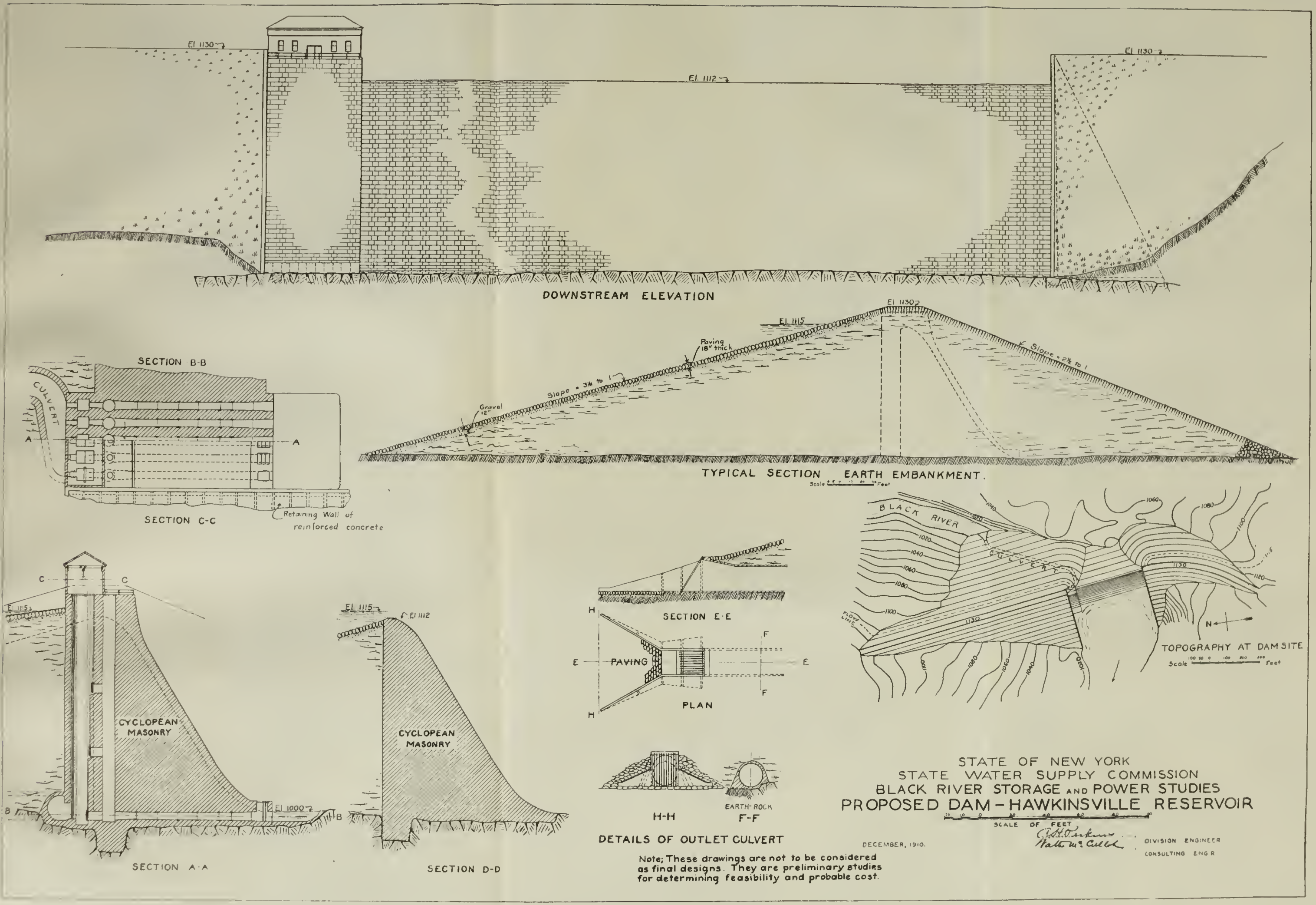
Scale 100 50 0 100 200 300 Feet

TE OF NEW YORK
TER SUPPLY COMMISSION
STORAGE AND POWER STUDIES
– HAWKINSVILLE RESERVOIR

SCALE OF FEET

Walter McCulloh

DIVISION ENGINEER
CONSULTING ENGR



STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION
BLACK RIVER STORAGE AND POWER STUDIES
PROPOSED DAM - HAWKINSVILLE RESERVOIR

SCALE OF FEET

DECEMBER, 1910.

C. H. Parker DIVISION ENGINEER
Walter McCulloh CONSULTING ENG R

Note; These drawings are not to be considered as final designs. They are preliminary studies for determining feasibility and probable cost.

Assistant Engineer, were sent to the Black river and started the surveys at the Hawkinsville reservoir site immediately below the existing state reservoir at Forestport. This survey was completed on August 11th, and the parties were then transferred to the Moose river, a branch of the Black, upon which is located the Higley mountain reservoir site, referred to in last year's report as "The Plains." The field work was continued as long as the men were able to work to advantage and it was safe to keep them in camp, in which they had been living during the summer and fall. On the fifteenth of November, camp was broken and the men returned to Albany to work up their notes, plot the maps and prepare the plans and estimates for the proposed reservoirs.

These surveys disclosed no disappointing features in connection with the proposed reservoirs except that the estimated cost of the Hawkinsville reservoir per unit of benefit to be derived is larger than was anticipated.

The general location of these reservoirs are shown on accompanying maps and photographs. Plate 2 is a general map showing watersheds of the Black, Grasse and Oswegatchie rivers. Plate 3 is a map of the Higley mountain reservoir and Plate 4 shows the proposed dam, gate house, and other outlet works. Plate 5 is a map of the Hawkinsville reservoir and Plate 6 shows the proposed works at the outlet.

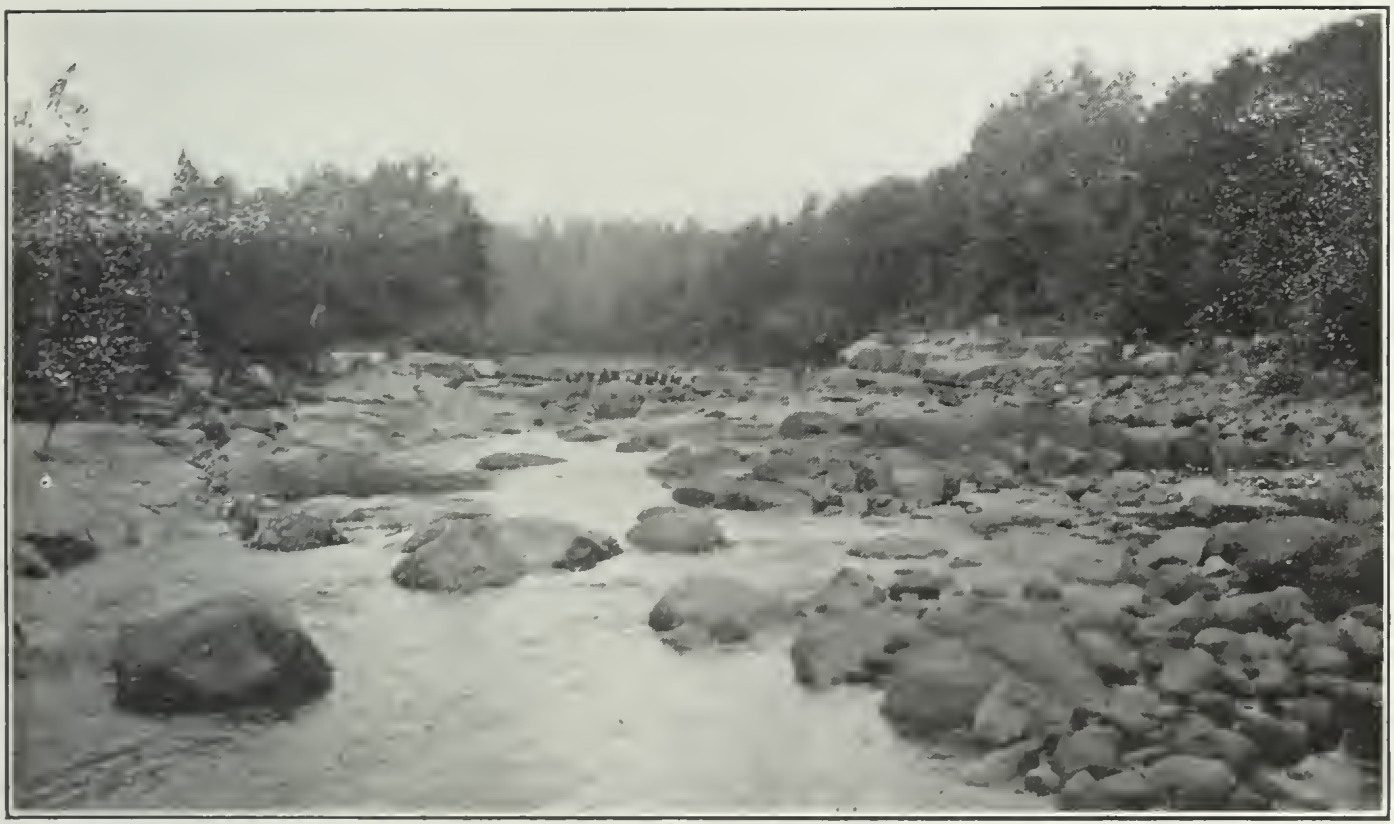
Hawkinsville Reservoir.— This reservoir will have a capacity of 5.3 billion cubic feet with a flow line and spillway crest at elevation 1112 feet above sea level. The spillway portion of the dam, 400 feet in length, will be of cyclopean masonry faced with concrete and founded upon bed rock. Plate 6 is from a photograph taken at the dam site. Rock is exposed in the bottom of the stream and a few feet above on the sides. It is an excellent quality of limestone lying in apparently horizontal beds. In order to make suitable connections with the earth embankments forming the end portions of the dam, the plans contemplate the earth embankment being carried all the way across at the back of the masonry spillway. The upstream face of the earth dam will be 3½ to 1 slope and paved with 18-inch stone on 12 inches of gravel. The downstream slope will be 2½ to 1 with a toe of loose rock 20 feet high where the embankment comes in contact with or close to the rock surface. Suitable precautions will be taken to connect the earth to the rock surface by an impermeable joint. The top width will be 30 feet. The slopes for the earth dam as given above are in excess of current practice and could probably be reduced with safety to 3 to 1 and 2 to 1 respectively, if suitable material is procurable. Further study of the material available for the fills will have to be made before this matter can be definitely stated.

The masonry section is designed in accordance with current practice. The gatehouse is located at the dam and the water is carried to it through the earth section in a culvert founded partly on rock and partly on earth. Special precautions will be taken at the point where the foundations change in order to provide for unequal settlement. Suitable collars on the outside of the culvert and other precautions will be taken to prevent water following along the masonry surfaces through the dam. Water will be drawn from the reservoir through five 48-inch pipes discharging into a pool below. Suitable gates, stoplog grooves, etc., are provided for, as shown on the plan.

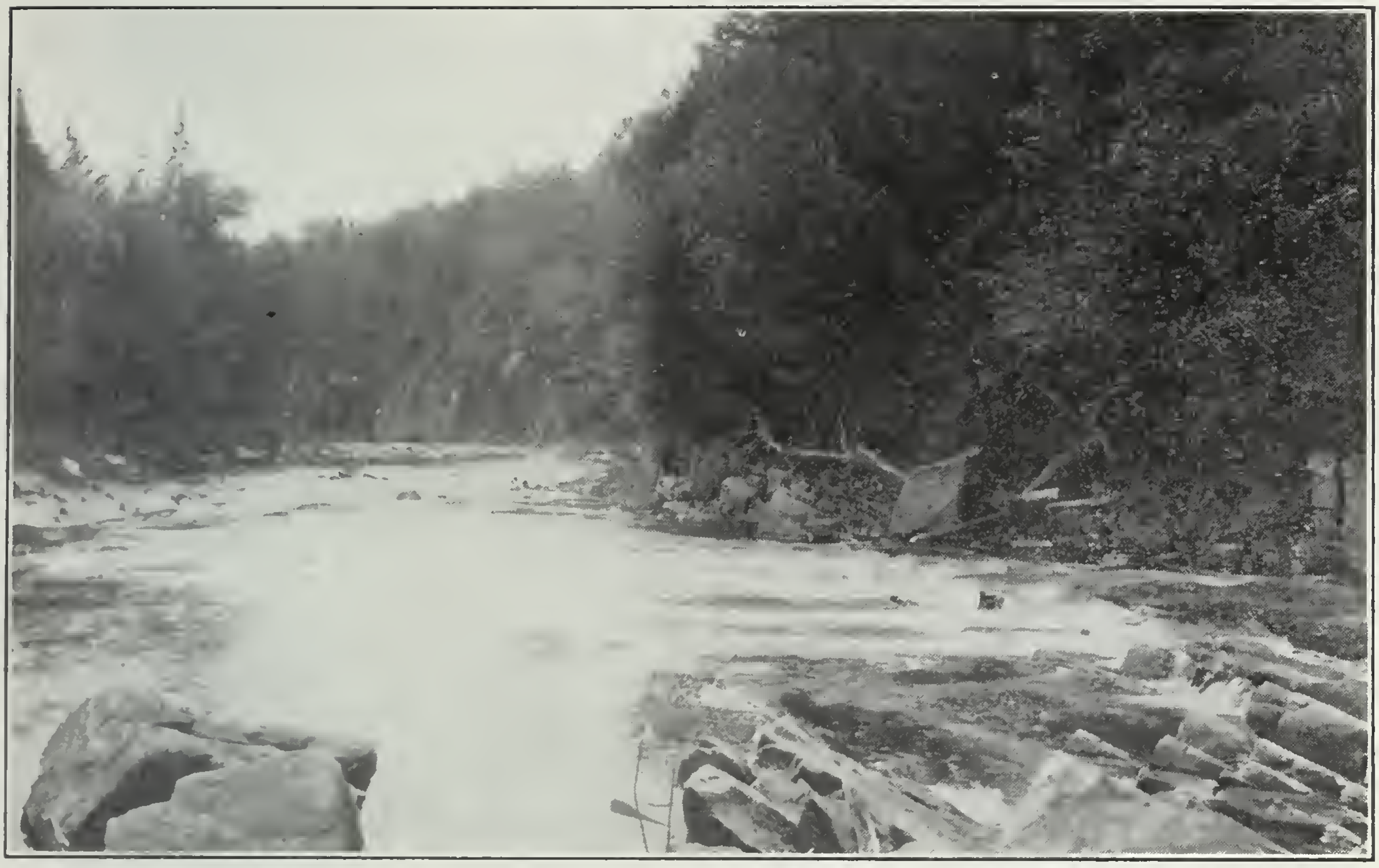
If rock should be found to exist near the surface at either of the three saddles across which dikes are to be built, as shown on Plate 5, the cost of the main structure could be very materially lessened by placing the spillway there. This subject should be thoroughly investigated before final plans are prepared, though it is not anticipated that the investigation will disclose ledge within working distance of the surface at any of these points.

The estimated cost of the reservoir complete is $2,830,000.

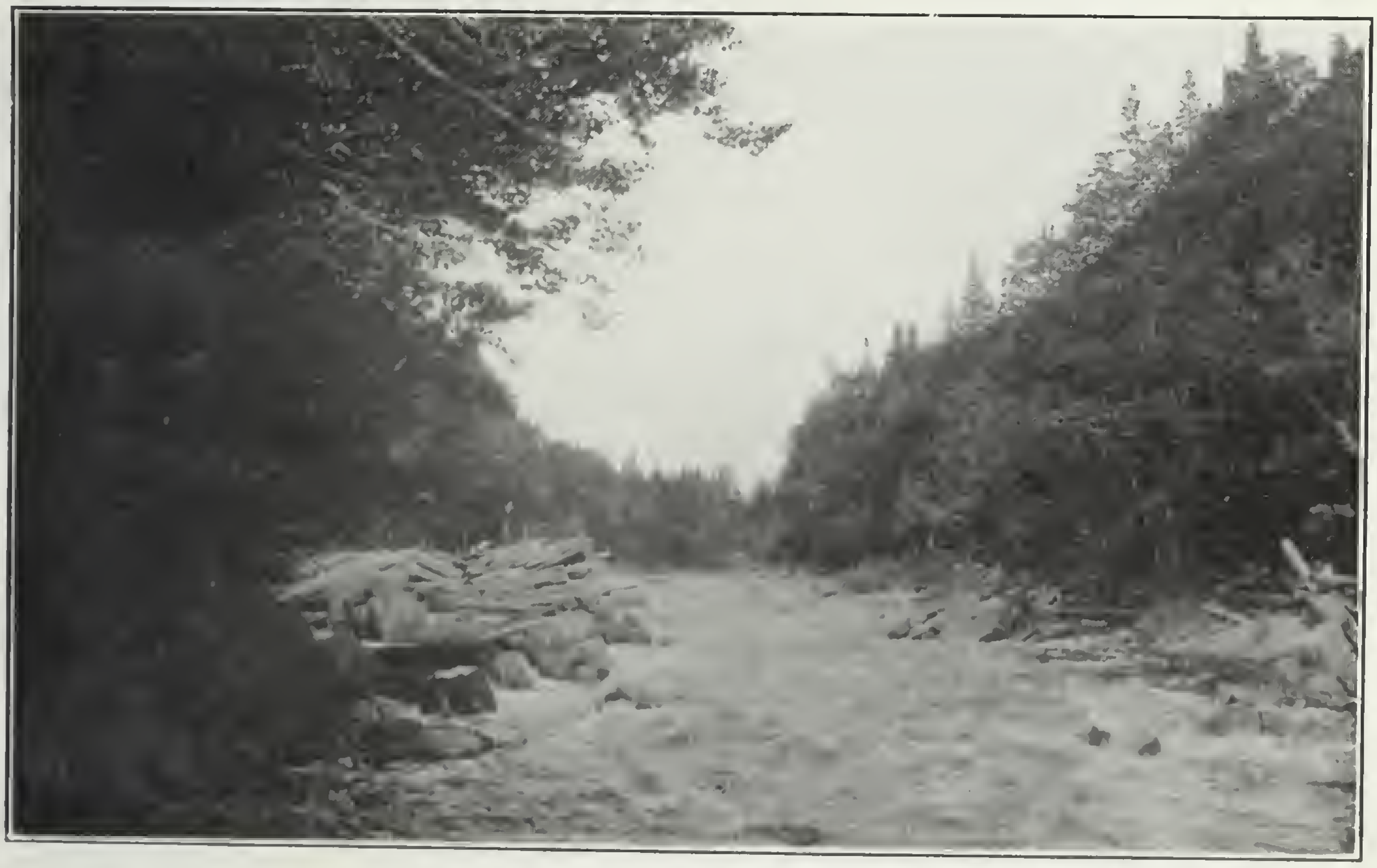
Higley Mountain Reservoir.— This reservoir as planned will have a capacity of 5.2 billion cubic feet with spillway crest at elevation 1880. The capacity is limited by the drainage area above, rather than by the natural conditions at the dam site and elsewhere on the basin. The above mentioned capacity affords practically complete regulation of the stream at the dam site. The main dam will be of cyclopean masonry faced with concrete and founded upon granite rock ledge. Plate 8, a reproduction of a photograph taken at the dam site, shows that rock is exposed in the bed of the stream and that it also outcrops at various points along the sides. It is believed to be only a few feet below the surface at the saddles lying to the south of the dam, hence the spillway is located at one of these points. The spillway is to be 450 feet in length and will be provided with a logway at one end.



Black River Watershed
Proposed Hawkinsville Reservoir. Dam Site Looking Up Stream



BLACK RIVER WATERSHED
South Branch of Moose River. Proposed Higley Mt. Reservoir
Dam Site Looking Down Stream



BLACK RIVER WATERSHED
South Branch of Moose River. Proposed Higley Mt. Reservoir
Dam Site Looking Up Stream

Water is to be withdrawn from the reservoir through six 48-inch pipes extending through the main dam. The valve control, location of gate house and other general features are shown on plate 4.

The estimated cost of the reservoir complete is $1,340,000.

State lands.— The Hawkinsville reservoir is located entirely outside the boundaries of the Adirondack park, and while there will be 56 acres of State lands submerged, these lands do not come within the constitutional prohibition, being improved lands taken for taxes.

The Higley mountain reservoir covers territory composed very largely of State lands. The total water surface is 6.6 square miles or 4,224 acres. Of this total, 3,590 acres are State lands — 1,840 acres forested, and 1,750 acres deforested. There are 1,690 acres of private lands below the taking line — 1,080 acres forested and 610 acres deforested.

The work on these proposed reservoirs has been carried somewhat further in the matter of land surveys than has been done on some previous reservoir surveys. It is believed that no more work will be required in surveying land lines on the Higley mountain reservoir and on the Hawkinsville reservoir the work has been left in such shape that this feature can be carried to completion with a minimum expenditure. Some test pits should be sunk at the Higley mountain dam site before final plans are made. There is every indication that rock foundations are within a few feet of the surface everywhere; but the fact should be definitely settled by test pits and drill borings.

Table VI presents the various features of the effect of storage in these reservoirs. All the data for an exact study has not yet been secured and these figures are preliminary only. Benefits will doubtless be considerably greater than shown because of the fact that the table takes into account only present installations and installations of a capacity equal to the low water flow of the stream at undeveloped sites. No account is taken of possible increases in capacity rendered commercially feasible by the increased flow of the stream due to the use of stored water. A power survey similar to that made on the Hudson and Genesee rivers during the past year, and more stream flow data will make an estimate of these further benefits practicable.

TABLE VI.

BLACK RIVER — EFFECT OF STORAGE ON WATER POWERS.

	HIGLEY MT. RES.		HAWKINSVILLE RES.		Total L. Black R.	Total
	Moose R.	L. Black R.	U. Black R.	L. Black R.		
	H. P.-yrs. per yr.	*H. P.-yrs. per yr.*	*H. P.-yrs. per yr.*	*H. P.-yrs. per yr.*	*H. P.-yrs. per yr.*	*H. P.-yrs. per yr.*
1. Present wheel capacity of plants	10,736	72,565	0	72,565	72,565	83,301
2. Power available from present flow with present installations in an average year	12,280	61,770	425	61,770	61,770	74,475
3. Power available at undeveloped sites from installations of capacity equal to minimum flow, average year	12,500	....	....	....	....	12,500
4. Sum of two preceding items	24,780	61,770	425	61,770	61,770	86,975
5. Total gain in power due to storage in an average year	8,480	7,320	2,380	8,235	15,555	26,415

Moose river includes S. branch of the Moose from Higley Mountain dam to McKeever and the Moose from McKeever to junction with the Black.

U. Black includes Black from Hawkinsville dam to junction with the Moose.

L. Black includes Black from junction with the Moose to mouth.

Higley Mountain reservoir affords a total gain of 15,800 H. P.-yrs. per year in power, due to storage of 6.0 billion cubic feet, at an estimated cost of $1,340,000 or $78 investment per horsepower of continuous power.

Hawkinsville reservoir affords a total gain of 10,615 H. P.-yrs. per year in power due to storage of 5.7 billion cubic feet at an estimated cost of $2,850,000 or $268 investment per horsepower of continuous power.

Black River Watershed
South Branch of Moose River. Basin of the Proposed Higley Mt. Reservoir

Black River Watershed
Proposed Higley Mt. Reservior. Stillwater on South Branch of Moose River

The investment charge for power due to storage water from the Higley mountain reservoir, with interest at 3½ per cent., will be $2.45 per year per horse power of continuous power. To this charge must be added depreciation, repairs, and operation charges. For work of the character planned, however, these items will be comparatively small, and the total cost of power derived in this manner will probably not exceed $3.50 per horse power per year for continuous power. When it is considered that not all the benefits have been included, as explained above, and that no plant in addition to that now installed must be provided to develop this power, one can readily appreciate the remarkable cheapness of this source of energy.

The investment charge for power due to storage water from the Hawkinsville reservoir, with interest at 3½ per cent., will be $9.24 per year per horse power of continuous power. Adding to this $1 per horse power per year for depreciation, repairs and operation expenses, the cost of energy from this source will be $10.24 per year per horse power of continuous power.

WEST CANADA CREEK.

In the fourth annual report attention was called to the West Canada creek and to its undeveloped power possibilities, if effectual regulation of the flow could be accomplished by the construction of storage reservoirs.

As the studies of the storage possibilities on the creek were incomplete in our work of the previous years, it has been thought best to make a more complete reconnaissance of that stream this year to verify the information heretofore collected and studies made and reported upon in our previous reports. Such a reconnaissance was made in the month of November by Mr. Perkins and an assistant engineer.

One of these sites is on the south branch, west of Morehouseville. A dam 110 feet high and 570 feet long would impound 1.87 billion cubic feet of water. The other site is on the main branch of the creek at Swanson dam or the "first Stillwater" where a dam 120 feet high and 1,200 feet long would impound 2.32 billion cubic feet of water.

Both of these reservoir possibilities are above the Hinckley reservoir now being built for the Barge canal, but it would be possible and entirely practicable to use the stored water for the generation of power at the dams and again at the high fall below Hinckley by an arrangement to pass through that reservoir the same amount of water as is discharged from the upper ones.

The Morehouseville reservoir would furnish a contiunous regulated flow of 94 c. f. s. and the Swanson dam would furnish a regulated flow of 97 c. f. s. through the year. There are power possibilities at the dams of 1,700 horse power and 3,100 horse power respectively, but the cost of the development would be too high to make the proposition commercially feasible.

The storage can be used to better advantage by regulation for the falls below Hinckley.

The combined storage of the two reservoirs, amounting to 4.19 billion cubic feet, would effect a regulated flow of 460 c. f. s. in the dry months, which if utilized under 700 feet of the available head below Hinckley would produce 2,900 continuous wheel horse power, 80 per cent. efficiency. Such a development would be more practical and have a more accessible market for the power than any system of developments above Hinckley.

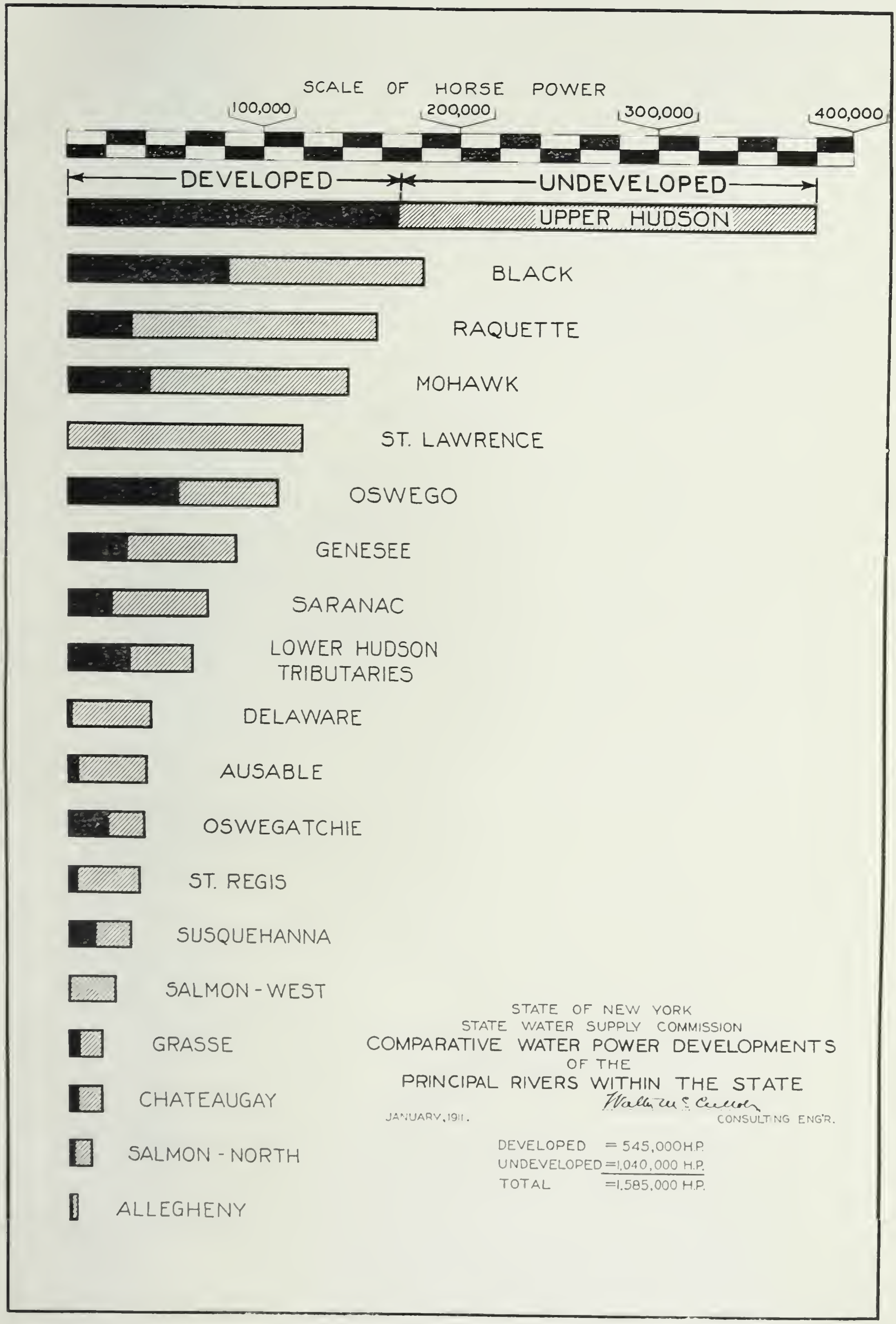
The estimates of cost of these reservoirs and the power development have not been completed at this date.

There are possibilities for greater storage in the Hinckley reservoir by the erection of a higher dam than the one planned for the Barge canal, but unfortunately this can not be done under existing laws. The facts and details of this situation have been set forth in our previous reports.

WATER POWER SURVEYS.

The power survey on the Hudson and Genesee rivers has been made for the purpose of determining with greater accuracy than has been heretofore possible in our investigations, the exact amount of power developed, the conditions under which it is being developed at each of the power plants, the water wheel installation, its capacity and efficiency, the amount of water required for the proper operation of the mills in their present condition, and the amount of water which will be required above the minimum flow

Plate 10



STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION
COMPARATIVE WATER POWER DEVELOPMENTS
OF THE
PRINCIPAL RIVERS WITHIN THE STATE

JANUARY, 1911.
Walter McCulloh
CONSULTING ENG'R.

DEVELOPED = 545,000 H.P.
UNDEVELOPED = 1,040,000 H.P.
TOTAL = 1,585,000 H.P.

of the river for the successful operation of the plants without loss of time. The survey further contemplated the collection of data as to the number of days in the year that each plant can run full power, and the number of days in the year which the plant is either completely shut down, or its efficiency reduced, the nature and extent of delays caused by low water and the financial loss to both the employers and the employees at the numerous power plants on the river. The survey also included the collection of data with regard to the possibility of new power developments at sites now undeveloped, and the possible enlargement of existing plants, so as to take full advantage of any storage which may be affected by the construction of reservoirs in the Hudson river watershed.

The party for the power survey on the Hudson river was organized with Mr. B. F. Vandervoort, assistant engineer, in charge, and field work started about the 15th of July, and completed by the end of September, at which time the party was transferred to the Genesee river at Rochester to make a similar survey on that stream. Since the 15th of November, the party has been in the Albany office working up the surveys, and preparing the necessary tables, compiling the data, etc. On these surveys our engineers have been met most cordially by the various power and manufacturing companies along the river and a great deal of valuable data has been collected, and every reasonable facility given us to obtain the information sought.

OFFICE STUDIES.

In the progress reports of the Commission made under the Fuller Act, the basis on which the benefits to water powers from the storage of flood waters were figured was the amount of horsepower added by storage at the time of lowest water in the streams in an average dry year. The limitations of this method have always been recognized and explanations of the figures made accordingly. At the time they were used it was felt that a more scientific basis for figuring the power benefits would be desirable, a method that would not only take into account the maximum rate at which energy would be added to the stream but would also show the total energy added in the year in terms of horsepower hours or horsepower years. The difference to the power users whether 10,000 horsepower is added to the stream for one hour or one month would obviously be very great.

Considerable time has been devoted to the study of this subject by our engineers during the past season, and a new method of computing benefits devised. The method previously used had the advantage of being readily comprehended by the non-technical person and of being readily applied with a limited amount of data. On the other hand, the utilization of the stored water so as to absolutely insure a fixed minimum flow in all years, while perhaps best for streams whose power is not developed up to the limit leads to a very uneconomical use of the reservoirs on streams which are highly developed as to power. As a condition of high ratio of development exists on the streams where storage is most valuable and most sought for, and as this condition will become more and more pronounced on all power streams, it is apparent that the subject of the basis of figuring the power benefits is of importance in securing a proper view of the relation of water storage to water power development. As an example of the distortion of view caused by the method heretofore used may be mentioned the case of the Oswego river. This river has a high ratio of development, that is, the ratio of the wheel capacity installed, to the low water flow of the stream is high. When the method of regulating for a minimum steady low water flow is applied to this river it is found that 11,000,000,000 cubic feet of storage would have been used to its fullest extent only once in the ten years between 1897 and 1906 inclusive. During six of the ten years, it would not have been used at all, and during two years only about one-half of the capacity would have been used. From these premises it was concluded and stated in previous reports that storage on the Oswego was not of great value. It is clear that capital if invested for use only once in ten years must when it is used, yield a very large return. Such a method of management of a storage reservoir would call forth just criticism on the part of the power owners on a stream when they discovered that after money had been spent for auxiliary power during the low water season, the storage reservoir above them still remained full of water. Another instance where the former method of com-

Plate 11

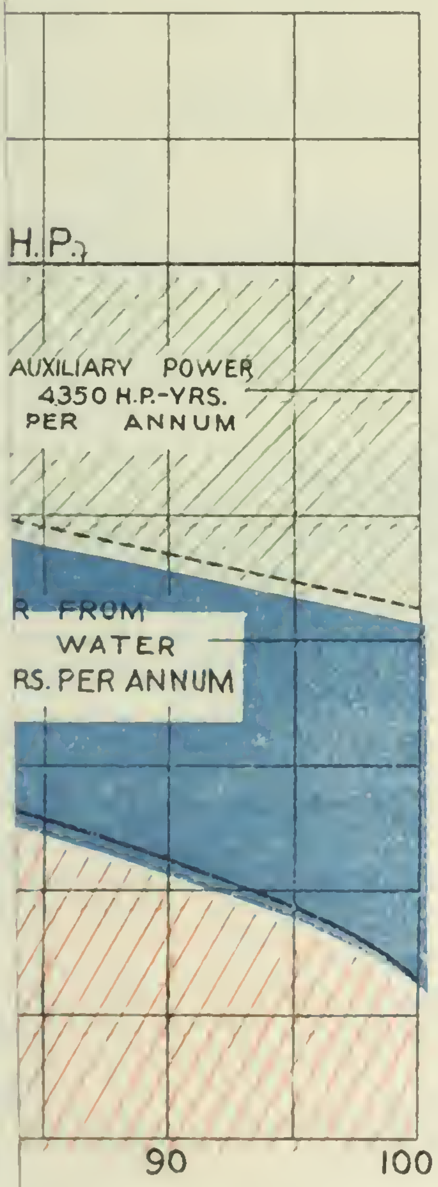
SION
CURVES

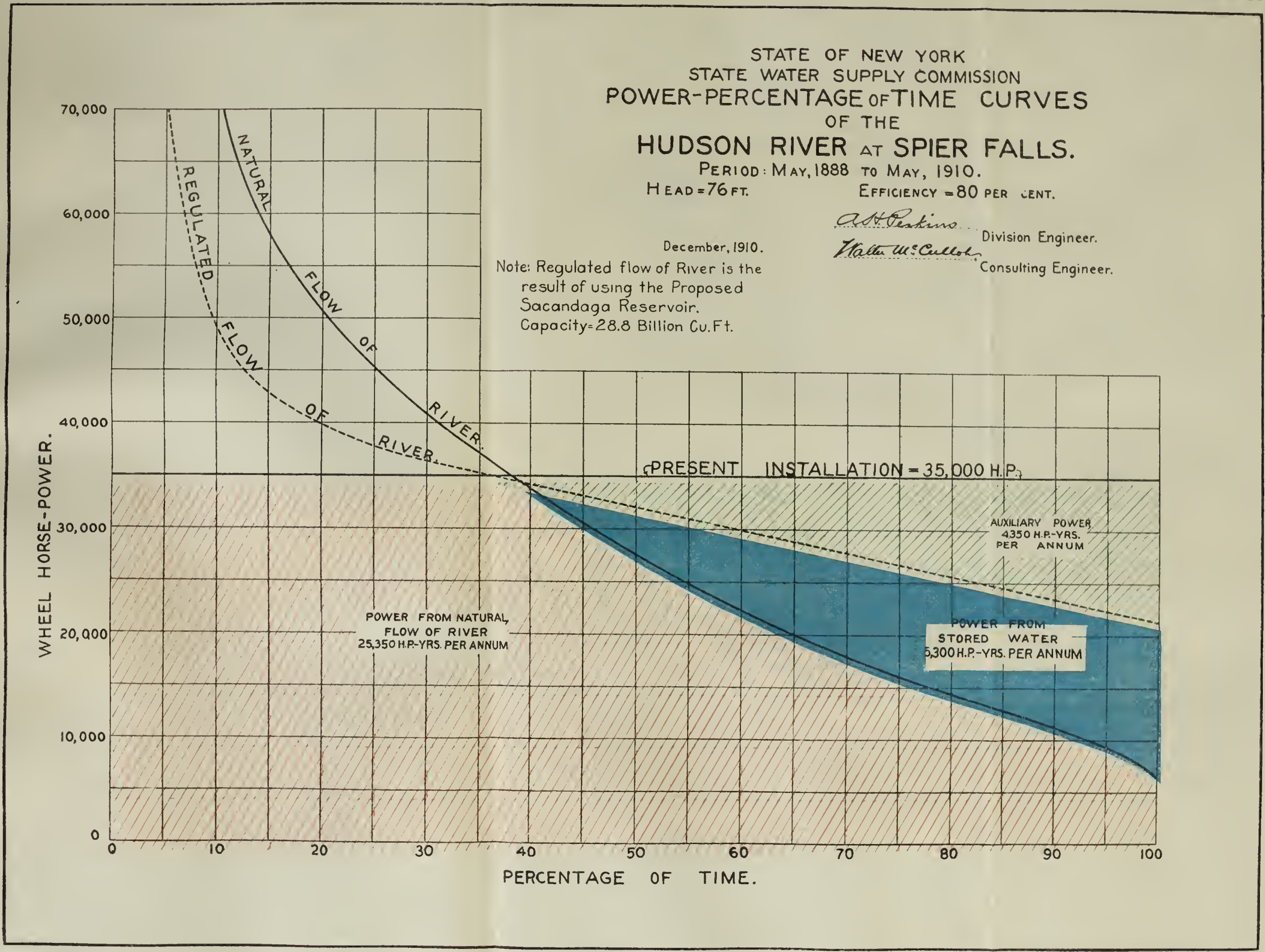
FALLS.

PER CENT.

ivision Engineer.

onsulting Engineer.





STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION
POWER-PERCENTAGE OF TIME CURVES
OF THE
HUDSON RIVER AT SPIER FALLS.
PERIOD: MAY, 1888 TO MAY, 1910.
HEAD = 76 FT. EFFICIENCY = 80 PER CENT.

A. H. Perkins Division Engineer.
Walter McCulloh Consulting Engineer.

December, 1910.

Note: Regulated flow of River is the result of using the Proposed Sacandaga Reservoir. Capacity = 28.8 Billion Cu. Ft.

WHEEL HORSE-POWER.
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
PERCENTAGE OF TIME.
0
10
20
30
40
50
60
70
80
90
100
NATURAL FLOW OF RIVER.
REGULATED FLOW OF RIVER.
PRESENT INSTALLATION = 35,000 H.P.
AUXILIARY POWER 4350 H.P.-YRS. PER ANNUM
POWER FROM NATURAL FLOW OF RIVER 25,350 H.P.-YRS. PER ANNUM
POWER FROM STORED WATER 5,300 H.P.-YRS. PER ANNUM

putation led to a wrong conclusion was in comparisons between reservoirs to determine their relative values. That method led to the conclusion that a small amount of storage on a stream was of much greater power value per unit of volume than a larger amount. This may be true for an undeveloped stream, but it is not true for a fully developed one.

In studying the subject this year it was assumed that from experience and by computation, there could be deduced a method for an average rate of release of stored waters so that while the assurance of a certain minimum flow would not be unduly sacrificed, the entire volume of stored water could be used practically every year, and in most cases at least a portion of the storage capacity of the reservoir could be used more than once each year, and at the same time, while the stored water is being released the flow would never exceed the wheel capacity of the economic development of the regulated stream. It is now believed that such a method of regulation is entirely practicable, or it can at least be very nearly realized, and that the benefits to power owners would be very much greater than if only a certain assurance of a minimum low water flow were attempted by the construction of storage reservoirs. The studies were made graphically and the results in the form of two typical diagrams are submitted herewith. Plates 11 and 13.

The diagram on Plate 11 gives the conditions at Spier Falls dam as they would be if the Sacandaga reservoir were built and operated as above proposed, which is typical for the Hudson river. The diagram is constructed as follows. The monthly discharges of the river as shown by all the stream flow records available were arranged in a table in the order of their magnitude, and the percentage of time during which a given horse power could have been developed was then computed from this table. With the percentage of time for an abscissa and the given number of horse power as an ordinate, a point was determined and plotted. Through a succession of points thus obtained the curve marked "Natural Flow of River" was drawn. If any point be taken on this curve the number read vertically below it at the bottom of the diagram is the percentage of the time on the average that the power read horizontally opposite it to the left could be developed by the natural flow of the river.

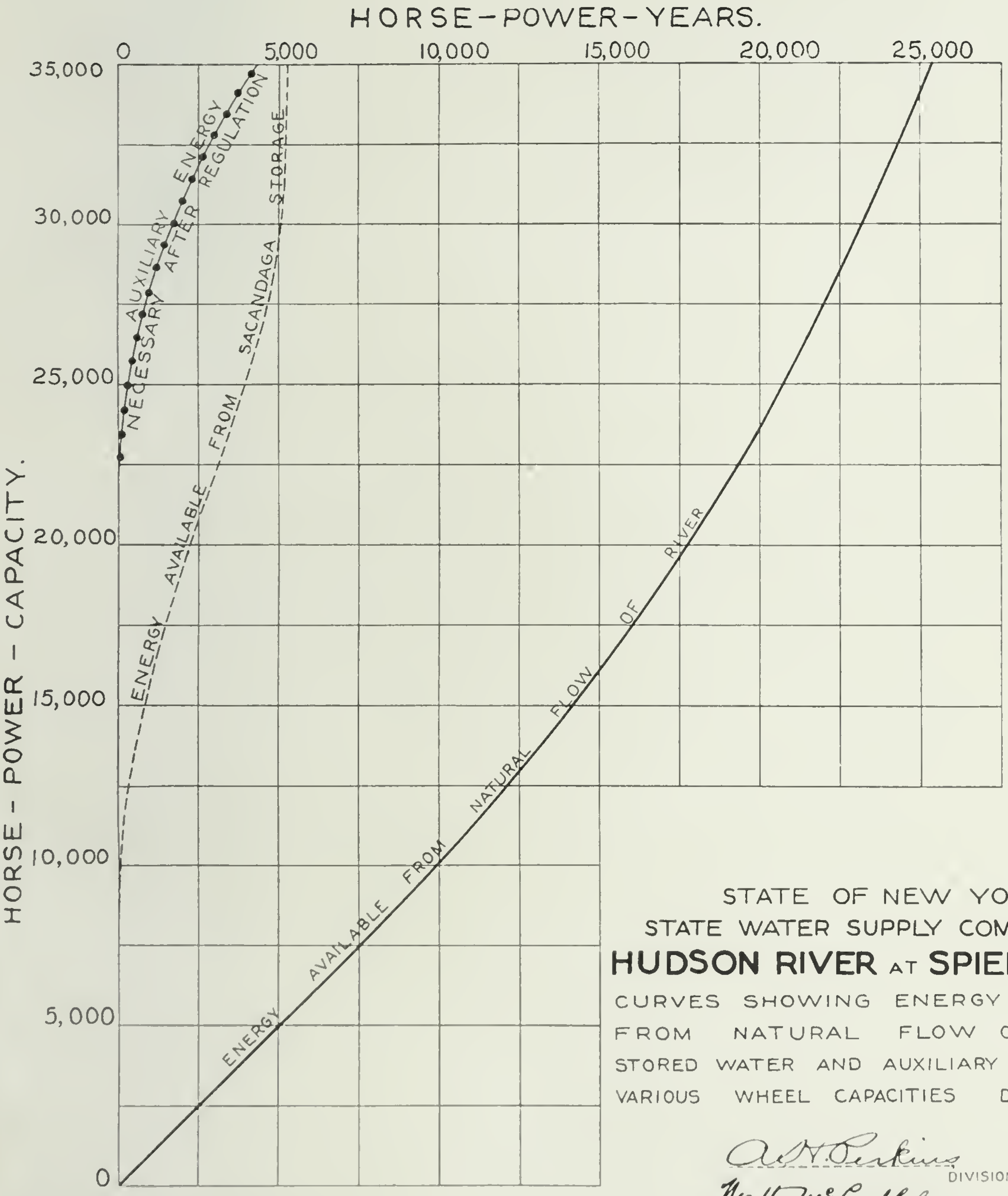
In a similar manner on the basis of the discharge of stored water, the curve marked "Regulated Flow of River" was plotted. The present wheel installation is shown on the diagram as a horizontal line.

Several important deductions can be made directly from this diagram. The area bounded by the present installation line, the natural-flow-of-river curve, and the axes of co-ordinates (the red area) is, when properly integrated and interpreted, the average energy furnished by the stream per year. The area below the line of present installation and between the curves representing the natural-flow-of-river and the regulated-flow-of-river (the blue area) is, when properly integrated and interpreted, the energy furnished by stored water in the average year.

For the purpose of convenient study "energy curves" have been plotted from the "power-percentage-of-time curves," for several important waterfalls. Plate 12 is such a set of curves for Spier Falls. From these diagrams may be read the amount of power that would be derived from each of the three sources of energy (natural flow, Sacandaga storage and auxiliary plant) for any given capacity of development. For example, with a development of 30,000 horse power water wheel capacity at Spier Falls, the energy from the natural flow of the stream would be 23,000 horse power years per annum; the energy derived from stored water would be 5,000 horse power years per annum, and the energy to be derived from some auxiliary power would be 2,000 horse power years per annum.

In connection with the power benefit investigations, extensive studies have been made from an engineering view point, of various laws relating to water storage, water power, the construction of dams by the State, and the general principles of taxation for benefits accruing from public improvement works. Special attention has been given to those New York State laws which have a bearing upon the execution of the plan suggested by your Commission in the last annual report, for the progressive development of the water powers of the State for a State revenue. This study was made by Mr. Perkins, under my direction, and a report, with extracts from the laws, has been submitted by him and was referred to Commissioner Milo M. Acker in October.

Plate 12



STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION

HUDSON RIVER AT SPIER FALLS

CURVES SHOWING ENERGY DERIVED FROM NATURAL FLOW OF RIVER, STORED WATER AND AUXILIARY POWER FOR VARIOUS WHEEL CAPACITIES DEVELOPED.

A. H. Perkins
DIVISION ENGINEER
Walter McCulloh.
CONSULTING ENG'R.

DECEMBER, 1910.

Note: Proposed Sacandaga Reservoir has a capacity of 23.8 Billion cubic feet.

HUDSON RIVER POWER SURVEY.

In our previous studies of the benefits to be derived from the storage of flood waters for power purposes, only general effects have been considered. Data as to exact heads, pondage uses and other essential factors were lacking for a detailed study. For the purpose of securing additional data, the power surveys were undertaken during the past season. Much of the material secured must be treated as more or less confidential, and much of it need not be considered in our reports. It has all been worked up and the results put in tabular form and filed for future reference. The principal physical conditions on the river may be summarized in the following statements with regard to the respective dams and power sites. These statements are also explanatory of Table VII submitted herewith.

TROY TO HADLEY.

Troy Dam.— Owing to the fact that the United States Government is now considering the reconstruction of this dam, or the substitution of a new one in another location, it was thought inadvisable for us to undertake any work at this point. It is understood that the proposed new dam will be located about 2,000 feet upstream from the existing one, and have the spillway crest at elevation 14.4 feet, or 1.9 feet higher than the present dam. The tide fluctuates about 2 feet at the foot of the present dam, so the proposed dam would create an average working head of about 13 feet.

Barge Canal.—Between Troy and Fort Edward the river is being canalized over a considerable portion of the route and where not in the river channel the canal follows it closely the rest of the way. The pool levels proposed by the Barge canal plans determine the heads at the several dam sites along this stretch of the river. In order to secure the fullest use of the water and gain additional head without causing the backwater from one dam during high water periods to interfere with the tail water at the dam next above, flashboards could be used in some cases to great advantage. With such a system of flashboards all the fall in the river between Troy and the mouth of the Sacandaga could be developed, except the small amount necessary to keep the water in motion, and 8 feet of fall between the tail water at the Stillwater dam and the Mechanicville pool. The utilization of this 8 feet is not commercially feasible owing to the lack of a suitable dam site, interference with Barge canal plans, and the great length and size required for a power canal to accomplish the desired end.

Waterford.— The fall of the river between the tail water of the lower Mechanicville plant and the pool above the proposed Troy dam will be concentrated at a point near Waterford by the proposed Barge canal dam to be located at the latter place. The crest elevation of this dam will be 28.7, giving a working head of 14 feet. The power which is possible of development at this dam will be the property of the State, to be used or disposed of under such laws as may be enacted in the future.

Mechanicville, lower dam.— This dam concentrates the entire head between the proposed Waterford pool level and the tail water below the upper Mechanicville dam, affording a working head of 18 feet.

Mechanicville, upper dam.— The working head here is 17.5 feet, and this could be increased to 19 feet by the use of flashboards.

Between Mechanicville and Stillwater occurs the 8 feet of unutilized fall heretofore referred to.

Stillwater.— The working head here is 8 feet. Owing to the low head, this fall is developed only up to the low water flow of the stream. With the use of flashboards anther foot of working head could be obtained without interfering with the Thompson water powers, next above.

Thompson.— The dam at this point concentrates all that is practicable of the 22 feet of head between the Stillwater pool below it and the Fort Miller tailwater, next above. No increase in head is possible without interference with the latter.

Fort Miller.— The head is 9.5 feet at this point, but 10 feet could be secured by clearing out the tail race.

Crocker's Reef Dam.— This dam was constructed by the State. It creates a head of 4 feet, which could be increased by use of flashboards to 5 feet, but this is too small a fall to be commercially attractive. It has been suggested that this head might be advantageously combined with that at Fort Miller by raising the dam at the latter place. A study of the commercial and engineering features of such a plan is recommended.

Fort Edward.— The working head of 19 feet at this point is a complete development of the entire fall between the Crocker's Reef pool and the tail water of the Hudson Falls plants, next above.

Hudson Falls.— Power is developed here at two dams. The lower plant works under a head of 57 feet in three stages, at Baker's falls and the upper one under a head of 13 feet at a point 2,200 feet up stream from the head of the falls proper. The water above Baker's falls is diverted by a timber crib dam in bad condition. The head could be increased 5 feet by the construction of a new dam. Within the past three years a development has been made on the west side of the river by the construction of an intake, head race and power house, utilizing the full available head of the falls. The head of 13 feet at the upper dam cannot be increased without interfering with the Glens Falls water powers.

Glens Falls.— The working head is 40 feet at this point and if the old diversion dam is replaced by a new one, it appears feasible to increase this to 45 feet.

Feeder dam.— This dam was built by the State for the purpose of diverting water to the Champlain canal. During the navigation season, 300 second feet is withdrawn from the Hudson. The total available head is 15 feet, but the working head is 13 feet, two feet being lost in tailrace. The dam could not be raised without diminishing the available head at Sherman Island.

Sherman Island project.— Sherman Island is located 8 miles above Glens Falls measured along the course of the river and 3 miles below Spier Falls. At this point is located the only remaining large undeveloped power site on the Hudson between Troy and Hadley. It would utilize all the head between the feeder dam pool and Spier Falls tail water. The dam to utilize this possibility would be 51 feet high above the present water surface, and 800 feet long on top, and have the spillway crest at elevation 350. With the stream flow regulated by the Sacandaga reservoir, 25,200 horse power could be operated 60 per cent. of the time.

TABLE VII.

HUDSON RIVER POWER DEVELOPMENTS BETWEEN TROY AND MOUTH OF SACANDAGA RIVER.

			PRESENT CONDITIONS				CONDITIONS AFTER REGULATION WITH 29 BILLION CU. FT. OF STORAGE AND FULL IMPROVEMENT.					
										AUXILIARY POWER REQUIRED		
	Miles from Albany	Drainage area square miles	Working head, ft.	Rated H. P. of turbines	Rated H. P. of auxiliary power	H.P. yrs. available from water in average year	H.P.-yrs. per year added within present wheel capacity from storage	Ultimate working head	H. P. capacity of turbines for 24-hr. continuous power 60% of average year	Rated H. P.	H. P. years per year	H. P. years added by storage with capacity given in column X
I	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*	*XII*	*XIII*
			WATER POWER FULLY OR PARTIALLY DEVELOPED									
Troy	6	8,100	7 to 10	2,451	1,450	2,451	......	13	12,800	9,100	1,420	1,185
Lower Mechanicville	16	4,587	18	7,600	1,000	6,700	760	18	10,450	5,330	880	1,290
Mechanicville	18	4,517	17.5	8,527	5,450	7,100	970	19	11,000	5,620	930	1,360
Stillwater	20	3,760	8	1,024	150	1,024	......	9	4,300	1,800	340	575
Thompson	35	2,890	11.5 and 17	4,590	......	3,800	690	11.5 and 17	5,500	1,450	300	890
Fort Miller	38	2,880	9.5	1,291	......	1,291	......	10	3,800	1,020	210	620
Fort Edward	47	2,815	19	6,956	......	5,500	1,120	19	7,250	1,940	410	1,180
Hudson Falls	50	2,810	70	17,872	1,460	16,000	1,890	75	28,650	7,650	1,600	4,670
Glens Falls	53	2,806	40	20,536	......	13,700	2,380	45	17,200	4,600	960	2,800
Feeder dam	55	2,790	13	600	......	600	......	15	5,800	1,530	320	930
Spier Falls	65	2,777	76	35,000	......	25,300	5,100	79	30,200	8,060	1,690	4,820
Palmer Falls	70	2,760	85	24,850	......	21,400	3,370	90	34,400	9,180	1,920	5,600
Corinth	70	2,760	18	400	......	400	......	20	7,650	2,040	430	1,245
Totals	....	......	401	131,697	9,510	105,266	16,280	429	179,000	59,320	11,410	27,165
			WATER POWER UNDEVELOPED									
Waterford	12	4,620	......	......	......	......	......	14	8,150	4,150	680	1,000
Crocker's Reef	41	2,875	......	......	......	......	......	5	1,900	510	110	310
Sherman Island	61	2,782	......	......	......	......	......	66	25,200	6,730	1,410	4,110
Totals	....	......	......	......	......	......	......	85	35,250	11,390	2,200	5,440
Grand totals	....	......	401	131,697	9,510	105,266	16,280	514	214,250	70,710	13,610	32,585

Spier Falls.— The working head at the Spier Falls dam is 76 feet with a possible increase to 79 feet by the use of flashboards. Pondage is available over about 15,732,000 square feet; so that low load factors can be readily taken care of, but such manipulation of the stream flow disturbs the other powers below the dam having less pondage.

Palmer Falls.— A dam at the head of the natural fall at this point makes available a total gross head of 85 feet developed in two stages with working heads of 36 and 29 feet respectively. It appears feasible to increase the total gross head to 90 feet.

Corinth.— This power is not fully developed. The working head is 18 feet, and 20 feet is the maximum available.

HADLEY TO INDIAN LAKE RESERVOIR.

This survey was undertaken for the purpose of securing a profile of the river, a close estimate of the amount and value of the water powers in this section of the river, and an instrumental reconnaissance of the possibility of diverting Cedar river into Indian river for storage in an enlarged Indian river reservoir as proposed in 1909 report of the Commission.

Hadley.— The only power developed at present on this section of the river is at Hadley, immediately above the mouth of the Sacandaga river. This plant owned by the Union Bag and Paper Company is used for pulp grinding and paper manufacturing. The head now developed is 18.5 feet, and is created by a timber crib dam across the narrow rock gorge adjoining the mill. The rated capacity of the installation is 2,067 horse power. There is a good site here for a higher dam and considerable pondage. The late Geo. W. Rafter, in the report of the State Engineer for 1895, proposed a storage reservoir here and estimated its capacity at from 4 to 4.5 billion cubic feet with flow line at about elevation 615. In 1907 a partial survey of this project was made by this Commission and referred to in the reports of Mr. Freeman and Mr. Ropes. This survey showed that with the flow line at elevation 610, the capacity of the reservoir would be not over 2,000,000,000, and computations based upon the U. S. G. S. sheets show it to be about 1.4 billion cubic feet. Its importance is therefore very slight as a storage reservoir. Its greatest value would be for pondage purposes in connection with a large reservoir at Indian river, and the principal use of a dam at Hadley to elevation 610, would be for creation of additional head and a consequent increase in power. The gross head available would then be 63 feet. Both the Schroon and Indian river reservoirs would furnish water to it if built; but it is thought advisable at this time to consider only the Indian river storage in this connection. With the enlarged Indian river reservoir a flow of 1,060 second feet could be maintained continuously, and this flow on 63 feet of head would yield 6,100 horse power. Before the project could be carried out, nearly nine miles of the Adirondack division of the Delaware and Hudson rairoad would have to be relocated in very difficult country at a cost of probably not less than $300,000.

It is a matter for close surveys and estimates to determine whether the expense of constructing this reservoir would be justified. It is thought that until water power is more valuable than now, such expense would not be justified.

Above Hadley, although 84 per cent. of the entire fall in the river could have been easily developed, there are no power developments in the Hudson river proper. In the section from Hadley to North Creek, 36 miles, the Delaware and Hudson River Railroad occupies the valley, rendering power deveopment expensive in spite of the many favorable sites for dams. Above North Creek state lands interfere with development by private enterprise. With these difficulties in the way and the legal disability of private companies as regards acquiring lands and water rights for power developments, it is probable that the State alone can meet all the requirements in the development of the very valuable powers on this portion of the Hudson from Hadley to Indian river reservoir of which the following have been noted.

Millington Brook Project.—About 900 feet south of the mouth of Millington brook a dam with spillway crest at elevation 710 would create 60 feet of head. This dam would be 1,100 feet long and 60 feet high. Rock outcrops on both sides of the river, indicating suitable foundations. The regulated flow using 11.6 billion cubic feet of storage from Indian River reservoir is estimated at 800 second-feet, and the power at 4,400 continuous horse power. Four and one-half miles of the Adirondack branch of the Delaware and Hudson River Railroad would have to be relocated.

The Glen Project.—About one-half mile below the Glen, a dam with spillway crest at elevation 745 and creating a head of 30 feet appears feasible. The dam would be 450 feet long and 30 feet high. The foundations would be rock. One and one-half miles of the Delaware and Hudson Railroad would have to be relocated. The regulated flow is estimated at 790 second-feet and the power at 2,200 continuous horse power.

Gage Mountain Project.— Near the foot of Gage mountain, one and one-half miles below Mill creek, there is a good dam site with rock foundations. A dam 30 feet in height — crest elevation 817 — and a pressure tunnel two miles long would furnish a gross head of 70 feet and a working head of 60 feet. The regulated flow is estimated at 780 second-feet and the power at 4,200 continuous horse power.

Huckleberry Mountain Project.—At the foot of Huckleberry mountain, about one mile above Riverside, judging from the rock outcrops on the sides, there appears to be rock foundations for a dam. The spillway crest would be at elevation 1025, the length at the top 1,200 feet and the height 150 feet above the river bed. In connection with a tunnel 2½ miles long, there would be available a total gross head of 195 feet and a net working head of 182 feet. The regulated flow is estimated at 770 second-feet and the power at 12,700 continuous horse power. Eleven miles of the Delaware and Hudson Railroad would have to be relocated, and a small part of the village of North Creek would be flooded.

North River Project.—About 3,000 feet below North River, rock outcrops on both sides of the river. A dam to elevation 1120 would have a length of crest of 950 feet and would be 85 feet high above the bed of the stream. This dam and a tunnel 3,500 feet long would make available a gross head of 90 feet and a working head of 86 feet. The regulated flow is estimated at 750 second-feet and the power at 5,900 continuous horse power. This project would flood the village of North River and require the relocation of about 3 miles of highway.

Kettle Mountain Project.— The proposed damsite is about 3 miles above the confluence of the Boreas and Hudson rivers. Although no ledge outcrops appear on the surface, the high steep banks and the general geological character of this region would indicate rock near the surface. The dam would be built with spillway crest at elevation 1418, would be 800 feet long on top and 190 feet high above the river bed. The impounded water would back up to the mouth of Indian river. This dam in connection with a tunnel 2¾ miles long would make available a gross head of 296 feet and a working head of 280 feet. The regulated flow is estimated at 700 second-feet and the power at 17,800 continuous horse power.

Indian River Reservoir.— In the 1909 report, pages 517–18, the enlargement of the Indian river reservoir by the construction of a new dam at the head of Indian river falls and the diversion of the waters of Cedar river into it, was proposed. The proposed diversion of Cedar river contemplated a dam on Cedar river and a canal across the divide between the Cedar river and Indian river because no suitable reservoir sites exist on Cedar river. The controlling feature of this combination reservoir is the available runoff from the 197 square miles of drainage area on the Indian river and 94 square miles on Cedar river rather than the available storage capacity.

While a storage capacity of 29 million cubic feet per square mile practically controls the Sacandaga river, 40 million cubic feet per square mile is a more usual figure and is probably more nearly the amount necessary for the control of the Indian and Cedar rivers because the natural lake areas, aside from the reservoir areas on these streams, aggregate considerably less per unit of area of water shed than on the Sacandaga. There are no stream flow records on the Cedar river and those on the Indian are inadequate. The rainfall map of the state shows that the drainage areas of these two streams will be prolific producers of runoff and from a study of the Sacandaga it appears that a somewhat abnormally large percentage of the precipitation occurs during the "storage period," i. e., from December to May inclusive. In view of these facts a storage capacity of 40 million cubic feet per square mile, or 11.6 billion cubic feet is assummed as the practical limit of storage development for this area.

The very valuable powers on the Hudson between Indian river dam and the mouth of the Boreas river belonging to the state make the study of the hydrography of this region important. Gaging stations should be established on the Cedar and Indian rivers at an early date.

This season's surveys disclosed the fact that the Indian river dam at the site and up to the elevation proposed in the 1909 report, is impracticable. The U. S. G. S. sheet, upon which the studies were based, is somewhat in error at this point. A suitable damsite does exist, however, approximately a mile below, at which point a dam 140 feet high and 850 feet in crest length will raise the water to elevation 1660.

These surveys show also that instead of a dam and canal as proposed in the previous report, the damsite on the Cedar river is so good that it will probably be more economical to build a higher dam for a flow line at elevation of 1680, and thereby eliminate the necessity of a diverting canal. There is a saddle in the hills dividing the Cedar river reservoir basin from that of the Indian river, whose crest is at elevation 1671, and over which the water would naturally flow if the higher dam were built.

The dam now proposed would be about 43 feet high, 80 feet long on the bottom and 270 feet long on top. If the lower dam were built the diverting canal across the divide would be 2,200 feet long and 10 feet deep.

The Cedar river extends nine miles below the site of the proposed dam. The diversion of the water from this course would not be serious, however, because there are no riparian lands of value on this stretch. The combined capacity of the two reservoirs would be 11.6 billion cubic feet.

Between the surface of the water in the Indian river reservoir as above projected, and the junction of the Indian river with the Hudson, there is a total fall of 242 feet. Of this 50 feet should be allowed for storage capacity and 10 feet for loss of head in delivering the water through the 9,000 feet of distance. The minimum head available for power development will then be 182 feet, and with a regulated flow in the stream of 582 second-feet which is possible, this would give 9,600 horse power at 80 per cent. efficiency. With the average available head of 207 feet, 10,950 horse power could be developed. As the reservoir will be full a considerable portion of the time and never empty for any great length of time, the latter figure is a fairer one to assume. The regulation for this section of the river is justifiable on the ground that with the Sacandaga storage, which will probably be accomplished first, a large percentage of the drainage area of the Hudson will be controlled that regulation for best results at the Indian river dam will also produce approximately best results at points lower down the river. This will be apparent from the self-evident statement that if the entire stream were controlled, then a steady flow from each branch would produce a steady flow in the main channel. A further reason for this lies in the fact that the economic use of the water requires a wheel development which can be run at full capacity, say 60 per cent. of the time. There is thus, without any loss of energy, considerable opportunity for fluctuation of regulated flow within the economic wheel capacity during low water periods, while the stored water is being used to full advantage each season.

The developments herein proposed on the Hudson river and its branches would utilize 940 feet out of a total fall of 1,113 feet between the spillway crest of the proposed Indian river dam and the tail water at the Hadley dam. It has not been practicable to prepare accurate estimates of cost of these projects owing to lack of sufficient data, but we believe that none of them will exceed a cost of $200 per horsepower.

Table VIII is a resumé of the foregoing statements and shows also the economic developments figured on the basis of continuous operation 60 per cent. of the time and other elements based on Spier Falls data.

If to the total power indicated in this table there is added the 58,000 horsepower of continuous power, and 69,500 horsepower of 60 per cent. power, which may be practically developed on the Sacandaga, there results the grand total of 122,200 continuous horsepower, or 160,000 horsepower 60 per cent. of the year, of undeveloped water power on the Hudson and Sacandaga rivers above their junction.

To deliver Sacandaga power in New York city would require no greater feat of electrical transmission than is now being successfully accomplished with power from Niagara Falls.

TABLE VIII.

HUDSON RIVER POWER PROJECTS BETWEEN HADLEY AND INDIAN LAKE.

PROJECT	Distance from Albany‡	Drainage area	Spillway crest elev.	Estimated regulated flow*	Net head	Maximum continuous H. P. with regulated flow average year	Estimated 60% power† average year	Miles of railroad to be relocated	
	Miles	*Sq. miles*	*Feet*	*Sec. ft.*	*Feet*				
Hadley	76	1,659	620	1,060	63	6,100	8,600	9.0	2,067 H. P. now developed.
Millington Brook	95	927	710	800	60	4,400	6,200	4.5	
The Glen	98	902	745	790	30	2,200	3,100	1.5	
Gage Mountain	101	871	817	780	60	4,200	5,900	1.5	
Huckleberry Mountain	105	839	1,025	770	182	12,700	17,900	10.5	
North River	117	780	1,120	750	86	5,900	8,300	....	
Kettle Mountain	124	634	1,418	700	280	17,800	25,100	....	
Indian River	132	291	1,660	580	207	10,900	15,400	....	
Totals	....	....	....	....	968	64,200	90,500	18.0	

---

* Figured for 11.6 billion cubic feet of storage used for regulation at the Indian river plant, unregulated areas yielding 0.35 second feet per sq. mi., minimum flow.

† By 60% power is meant an installation that can be operated to full capacity 60% of the time over a long period.

‡ Measured along the river.

With the Niagara developments at the western end of the State, the Hudson developments at the eastern end and the developments on the Genesee, Oswego and Black rivers and Canada creeks, there is evidently enough power available to make New York the manufacturing center of the United States. When this fact is considered in connection with the magnificent and unexcelled transportation facilities by canal and rail alongside of which this power may be delivered, and the large urban population in the midst of which the power can be used, thus insuring a labor supply, it is clear that the only thing preventing New York State from becoming such a center is New York State herself.

GENESEE RIVER.

In addition to the surveys and investigations prosecuted on the Genesee river in connection with the proposed improvement under the River Improvement Act, a power survey was made at Rochester and Mount Morris in the same manner and for the same purpose as that made upon the Hudson river. Our engineers were accorded the same cordial treatment on the Genesee river as was given them on the Hudson, and every opportunity was afforded them to make a careful study and survey of the numerous power plants on the stream. This power survey secured for the Commission a large amount of detailed information which has been tabulated and preserved.

ROCHESTER POWERS.

The development of the Genesee river for the production of power within the city of Rochester is made in four heads or falls. Three are obtained at the three successive natural falls over which the river passes in its course through the city and the fourth head is created by a dam known as the Johnson and Seymour dam, constructed across the stream about 600 feet above Court street.

The Johnson and Seymour dam, which creates the first head proceeding down stream within Rochester, is a masonry structure with a timber crest and vertical face; is straight in plan, 400 feet in length, and has a height of 6 feet measured from the ledge rock of the river bed on which it is founded to the timber crest. At this dam, the stream flow is divided equally between the

Johnson and Seymour race on the east side and the Carroll and Fitzhugh race on the west side of the river.

The Johnson & Seymour race is 2,370 feet long, varying in width from 20 to 70 feet. The heads in use on this race at the present time vary from 16 feet to 20 feet with a mean value of 17.3 feet. The water rights on the race are of four classes; first, or superior rights, and second, third and fourth rights. Mr. W. S. McMillan, commissioner for the race, states that the rights are distinguished as follows:

Fourth rights are those that are cut off when one-half the flow of the river is less than 14,000 cubic feet per minute.

Third rights, those cut off for flows of less than 12,000 cubic feet per minute.

Second rights, those cut off for flows of less than 10,000 cubic feet per minute.

First rights, those entitled at all times to their proportionate share of the flow of the river.

Mr. McMillan states, however, that in the actual control of the race, the commissioners have made no distinction between the second, third and fourths rights, but have allowed them all their proportionate amount of the flow of the race until it became less than 10,000 cubic feet per minute, at which time all the inferior rights were cut off. There are 51.5 water rights on the race owned by twelve different owners — 19 firsts, owned by six different individuals, and 32.5 inferior rights owned by ten different owners.

The Carroll and Fitzhugh race takes water from the river at the west end of the Johnson & Seymour dam and is entitled to the use of half the flow of the river. The race has a length of 1,650 feet and a width of about 60 feet. The heads in use on this race at the present time vary from 16 to 19 feet. On this race there are 76 equal water rights held at present by eight different owners.

Pondage over an area of 3,600,000 square feet is available above the Johnson & Seymour dam. This pondage while directly available to only those on the two races, is of course valuable to the powers below having a similar load factor to those on the upper races.

The second head in Rochester, proceeding down stream occurs at the Upper Falls. This natural fall is a few feet less than 90 feet in height, the head available being increased to 92 feet gross by a low diverting dam. The diverting dam furnishes pondage over an area of about 720,000 square feet. From the diverting dam the water is led into "Brown's" race on the west side and into a race leading to the Rochester Railway and Light Co.'s station No. 4 on the east side. The water is divided equally between the two races.

Brown's race is 1,860 feet long, 25 feet to 49 feet in width and 10 feet deep. There are 80 equal water rights on this race, held at present by 15 different owners.

Station No. 4 of the Rochester Railway and Light Company is located immediately adjacent to the falls and receives its water from an intake canal as noted above. This plant is not a modern plant, and probably does not make very economical use of the water available.

Seven thousand eight hundred feet down stream from the Upper Falls described above occur the Middle Falls. The power at this point is all owned by the Rochester Railway and Light Company and used in their station No. 15. This plant is located at the west end of the fall and operates under a head of 28 feet. The diversion dam is a combined timber and masonry structure founded on ledge rock. It has a vertical face, 7 feet high, a length of 450 feet, and makes a pondage area of 1,160,000 square feet.

Station No. 15 of the Rochester Railway and Light Company is a modern, well equipped generating plant of 2,700 horse power wheel capacity.

One thousand feet further down are the Lower Falls where the flow of the stream under 95 feet of head is used in station No. 5 of the Rochester Railway and Light Company. The wheel installation at this station is 10,200 horse power

The following table exhibits the present and future practicable power conditions on the Genesee river at Rochester as explained in the foregoing statements.

TABLE IX.

GENESEE RIVER AT ROCHESTER.

Effect of Storage on Water Powers.

NAME OF FALL	PRESENT CONDITIONS				CONDITIONS AFTER REGULATION WITH 13.5 BILLION CUBIC FEET OF STORAGE AND FULL IMPROVEMENT					
								AUXILIARY POWER REQUIRED		
	Working head ft.	Rated H. P. of turbines	Rated H. P. of auxiliary power	H. P. yrs. developed by water during an average year	H. P. yrs. per year added within present wheel capacity from storage	Ultimate working head	H. P. capacity of turbines that may be operated continuously 60% of average year	Rated H. P.	H. P. yrs. per year	H. P. yrs. added by storage with capacity given in column VIII
I	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*
Johnson & Seymour dam.......	16 to 19	2,042	617	1,564	303.6	20	3,432	1,209	254.5	686
Upper Falls	80 to 92	14,278	16,370	10,372	2,654.5	92	15,897	5,582	1,179.3	3,187
Middle Falls..................	28	2,700	0	2,280	420.0	34	5,910	2,075	438.0	1,180
Lower Falls..................	95	10,200	0	8,440	1,790.0	97	16,840	5,920	1,250.0	3,375
Totals..................	228.7	29,220	16,987	22,656	5,168.1	243	42,079	14,786	3,121.8	8,428

Barge Canal Plans.— The route finally adopted by the Barge canal authorities through the city of Rochester crosses the Genesee river in a pool to be formed in the river by a movable dam to be constructed about 300 feet south of the present Johnson and Seymour dam. It is proposed to maintain the pool at elevation 512.6 (Barge canal datum) or 9.5 feet above the crest of the Johnson and Seymour dam. Guard locks will be installed in the canal on either side of the river, also large capacity by-pass culverts around the easterly lock for the operation of the lower locks at this point. The Barge canal plans do not contemplate either the abstraction of water from the Genesee flow or the addition of water thereto, all required supplies coming down the canal from Lake Erie . It is the intention to keep the dam up only during the navigation season, it being feared that serious flood damages might result in case the mechanism of the dam failed to work because of ice or otherwise when a flood was impending.

Effect of Barge Canal Plans on Rochester Powers.— With proper arrangements, the Barge canal works may be made to materially increase the Rochester powers and without detriment to canal operations. On the other hand, unless such arrangements are made actions for damages may ensue because of the decrease in the pondage now available to the power users from the pond above the Johnson and Seymour dam, the larger part of which pondage will be cut off by the new dam. If the proper arrangements are made, the extra 9.5 feet of head may be made available for use during the period of canal operation, which period corresponds very nearly to the low water season of the year, and hence this power, operated in connection with present installations, would be practically equal in value to the same amount of horse power operated for the entire year. With the river regulated by means of the 13.5 billion cubic feet of storage proposed at Portage a minimum flow of 1,240 cubic feet per second could be maintained, which on 9.5 feet of fall would produce 1,070 (minimum) 24-hour 7-day wheel horse power.

Advantages of Pondage for Power Operation.— Local pondage is of very great importance to Rochester powers because of the fact that the average load factor is 62 per cent. for 24,875 horse

Plate 13

W YORK
LY COMMISSION
OF TIME CURVES
E
ROCHESTER
o FEBRUARY, 1910.
3Ft.
80%.

t. Perkins ..... Division Engineer.
Mc Culloh ..... Consulting Eng'r.

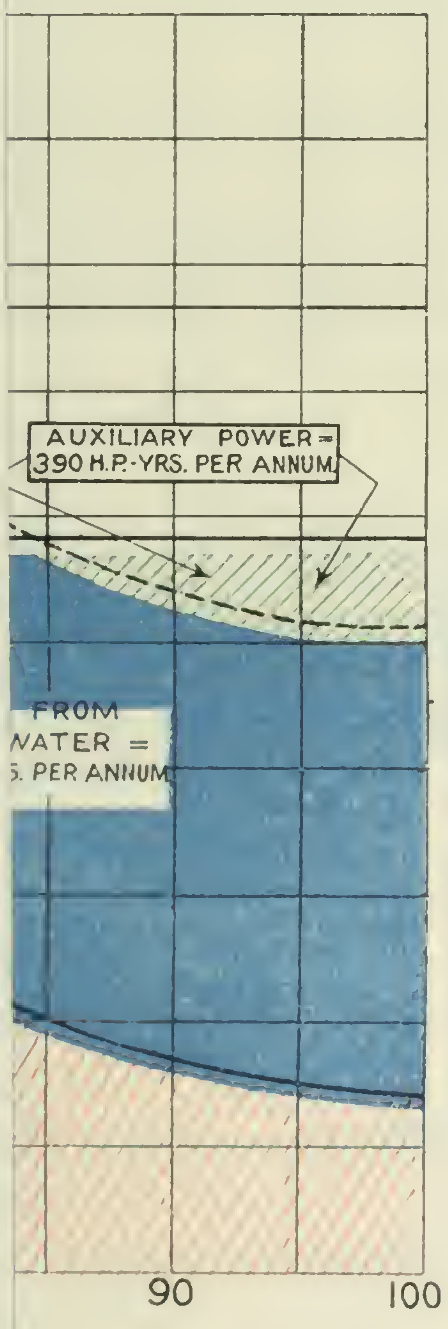
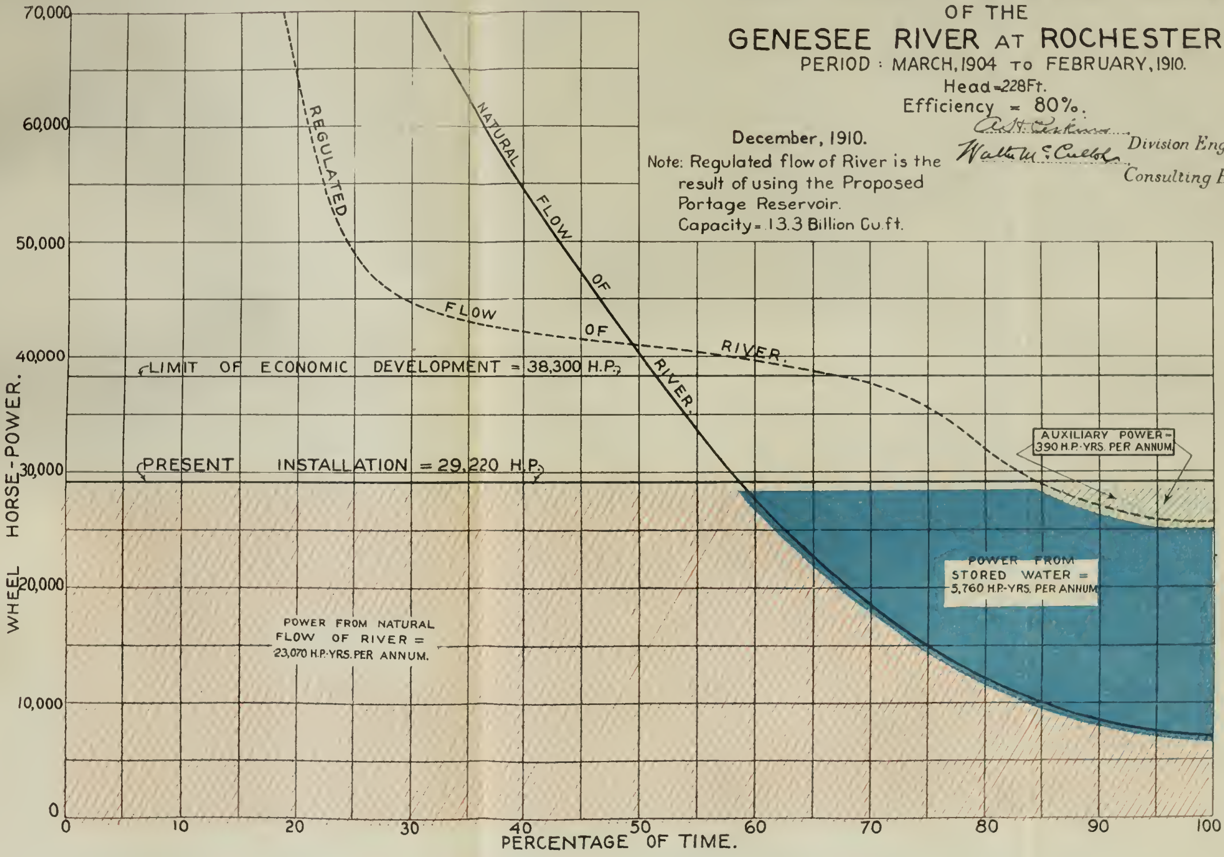


Plate 13



STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION
POWER-PERCENTAGE OF TIME CURVES
OF THE
GENESEE RIVER AT ROCHESTER
PERIOD: MARCH, 1904 TO FEBRUARY, 1910.
Head = 228 Ft.
Efficiency = 80%.

December, 1910.

A. H. Perkins Division Engineer.
Walter McCulloh Consulting Eng'r.

Note: Regulated flow of River is the result of using the Proposed Portage Reservoir.
Capacity = 13.3 Billion Cu. ft.

70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
WHEEL HORSE-POWER.
0
10
20
30
40
50
60
70
80
90
100
PERCENTAGE OF TIME.
REGULATED FLOW OF RIVER.
NATURAL FLOW OF RIVER.
LIMIT OF ECONOMIC DEVELOPMENT = 38,300 H.P.
PRESENT INSTALLATION = 29,220 H.P.
AUXILIARY POWER = 390 H.P.-YRS. PER ANNUM.
POWER FROM STORED WATER = 5,760 H.P.-YRS. PER ANNUM.
POWER FROM NATURAL FLOW OF RIVER = 23,070 H.P.-YRS. PER ANNUM.

power out of the 29,220 horse power of the wheel capacity now installed. The total head which can ultimately be developed at Rochester is 242 feet, not including the 9.5 feet at the proposed Barge canal dam; and after regulation with the Portage reservoir, 42,000 wheel horse power can be maintained continuously 60 per cent. of the average year, and this is taken as the economic development for continuous 24-hour horse power, auxiliary power being used to supply deficiencies during the remaining 40 per cent. of the time. An auxiliary plant of 14,760 horse power will be required for this purpose. With a load factor of 60 per cent. the total wheel horse power development should be 70,000 horse power. Of this amount, the regular low water flow of the stream and the auxiliary power would carry 42,000 horse power, and 28,000 horse power would be the maximum draft upon the pondage which under the 242 feet head would require 1,273 cubic feet per second. The water withdrawn from the pond and added to it again each 24 hours on the basis of the load curves of the Rochester Railway and Light Company would be 20,800,000 cubic feet.

Power Value of Regulated Flow.— The diagram on Plate 13 shows the power value of the regulated flow in the river to be derived from 13.5 billion cubic feet storage in the proposed Portage reservoir provided the storage is utilized as proposed in a preceding section of this report. (Water power surveys. Office studies.)

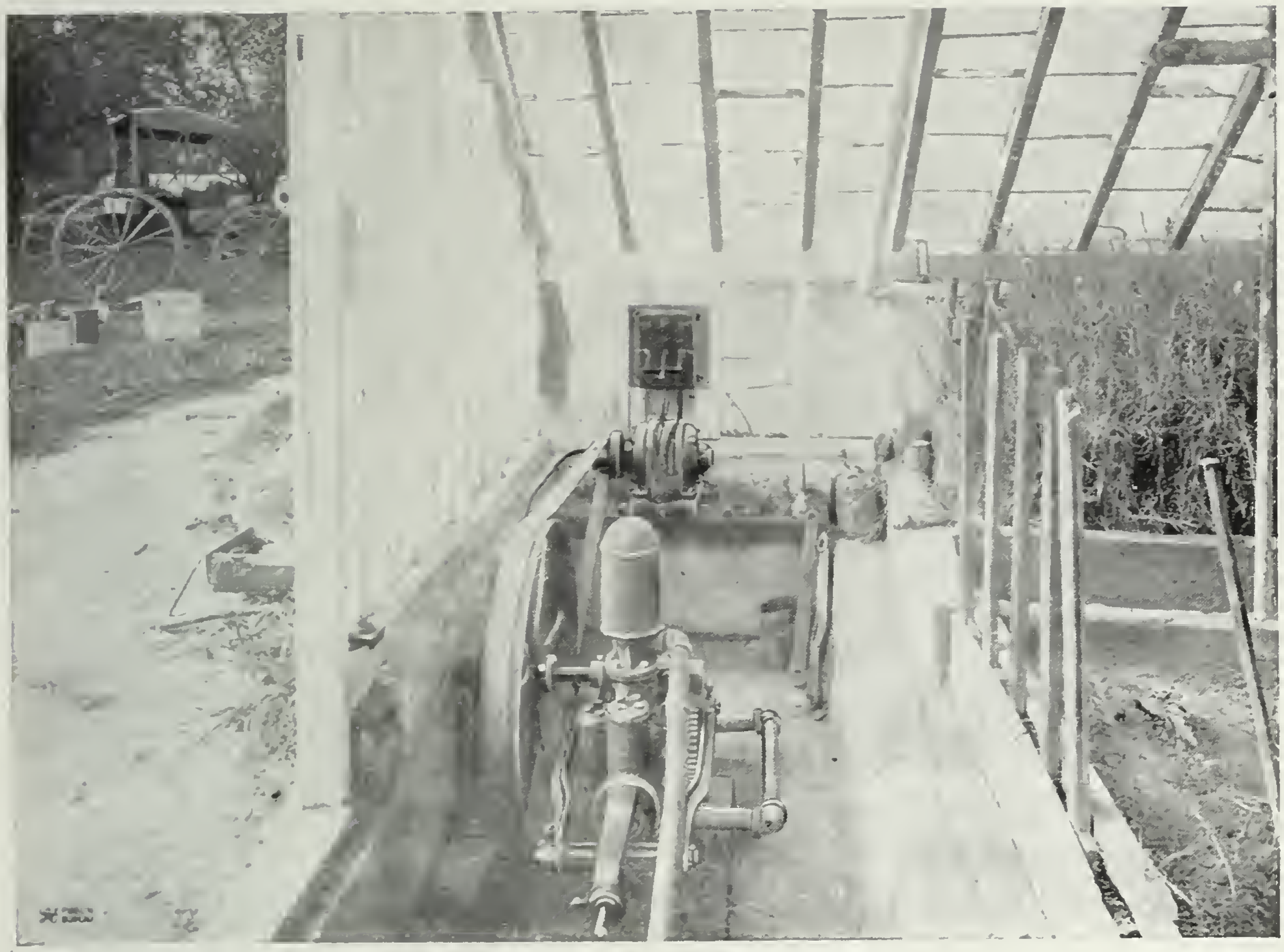
By referring to this diagram it will be seen that one-quarter of all the water power with regulated flow and present wheel installation capacity at Rochester will be derived from stored water (blue area), that without regulation the present installation can be operated at its full capacity for only 58 per cent. of the time and diminishes to a minimum of 7,500 horse power. Similarly the amount of energy necessary on the average from auxiliary power, is shown (the green area). The intercept on the 100 per cent. ordinate between the "Present-Installation" line and "Regulated-flow-of-river" curve measures the horse power capacity of auxiliary apparatus which on the diagram is about 3,000 horse power, required to maintain continuously the full power output equal to the present wheel capacity.

The diagram gives also a very clear indication of what will be the limit of economic development. It is near the point where the regulated-flow curve takes the sharp downward bend. As the installation capacity increases above that amount, the percentage of time that further capacity can be used rapidly diminishes. On the Genesee the economic limit of development for steady 24-hour power after regulation will be about 38,000 horse power on 228-feet head. Such a development would run 24 hours per day 66 per cent. of the time, or 8 months per year on the average. With such a development the energy furnished by the natural flow each year would be 28,000 horse power years, that from stored water 7,500 horse power years, while 2,500 horse power years would have to come from some auxiliary source.

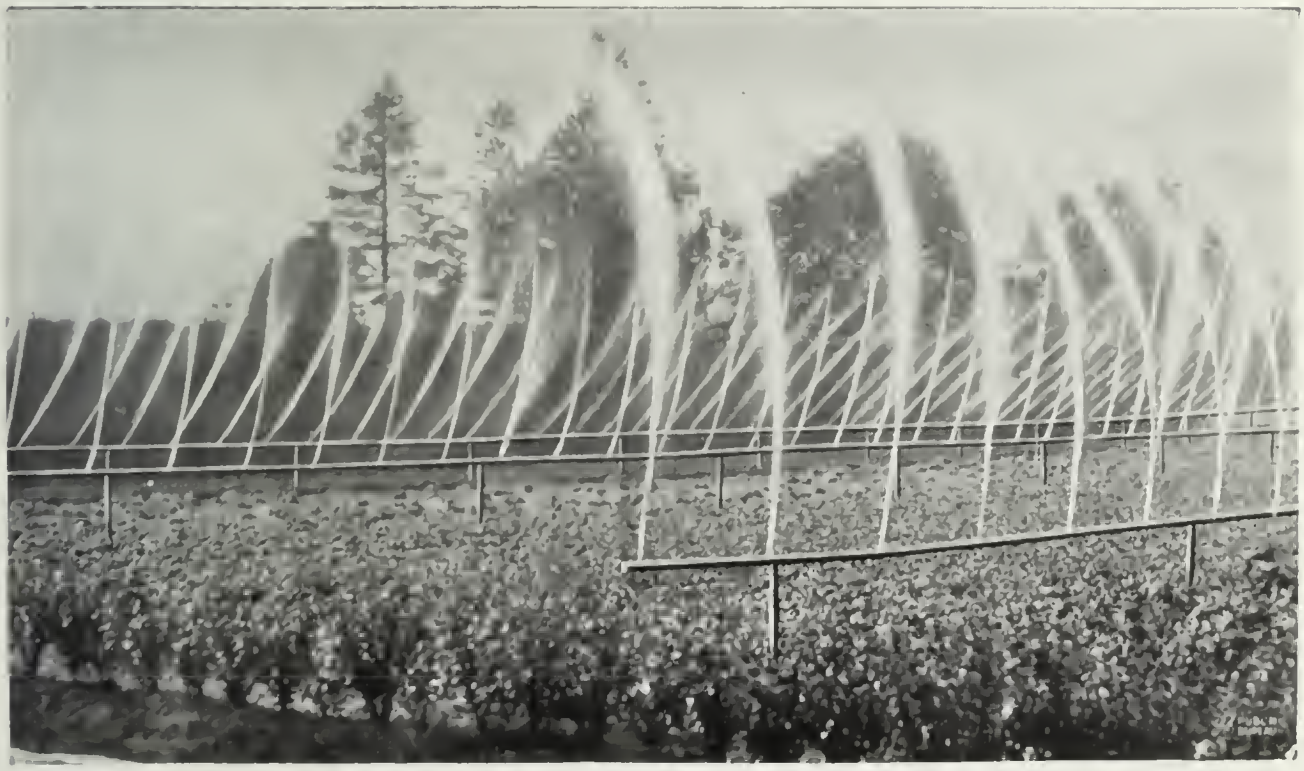
The diagram also brings out the fact quite forcibly that full economic advantages of the stream cannot be secured even after regulation without auxiliary power. Indeed, the Rochester diagram shows that a small auxiliary plant will render more additional energy available from the stream flow after regulation than the same amount of auxiliary capacity would render available before regulation; i. e., after regulation auxiliary power is more essential to best economic results than before regulation.

All the above is based on a steady 24-hour use of the power; i. e., a load factor of 100 per cent. The general conclusions are not, however, affected by a smaller load factor. Where there is pondage, a low load factor simply permits of a larger economic installation. Thus on the Genesee at Rochester, with a load factor of 62 per cent., the economic development would be about 62,000 horse power on 228 feet of head.

Demand for Power at Rochester.— The rapid growth of the city makes a rapidly expanding market for power as Rochester is largely a manufacturing city. Cheap and continuous power is a great incentive to rapid growth in population and conversely a rapid growth creates a demand for cheap power. In addition to the large amount of power derived from the Genesee river, there is 7,000 horse power of Niagara power now purchased in Rochester.



Irrigation at Irondequoit, N. Y.
Motor Driven Pumps



Irrigation at Irondequoit, N. Y.
Method of Spraying

SMALL WATER POWERS.

Investigations have been made this year with a view to ascertaining whether or not there would be any advantage to the agricultural interests of the State to have the small streams regulated by the construction of storage reservoirs for the purpose of developing hydro-electric powers, or for the irrigation of farm lands for raising various fruits and market vegetables.

There are in the State of New York a number of interesting small power developments where a farmer has constructed a dam on the little brook flowing through his lands, leading the water to a small power house where electricity is generated for use about the farm for lighting the house and other buildings, for pumping water, or operating the dairy and agricultural machinery, and operating churns, washing machines, and other household machinery. One interesting case of this kind is at Bolton Landing on the shore of Lake George, and another is at Oriskany Falls, where a most complete untilization of power of the small streams has been accomplished. A number of these small plants have been visited by Mr. D. R. Cooper, whose report on this branch of our investigations is submitted in full.

IRRIGATION.

A most interesting example of irrigation is found at Irondequoit, near the city of Rochester, at which place water is obtained from underground sources and forced through pipes about the premises with a force pump operated by an electric motor, the current being taken from an electric light company, during the hours of the day when the demand for lighting and power is not as great as at other times.

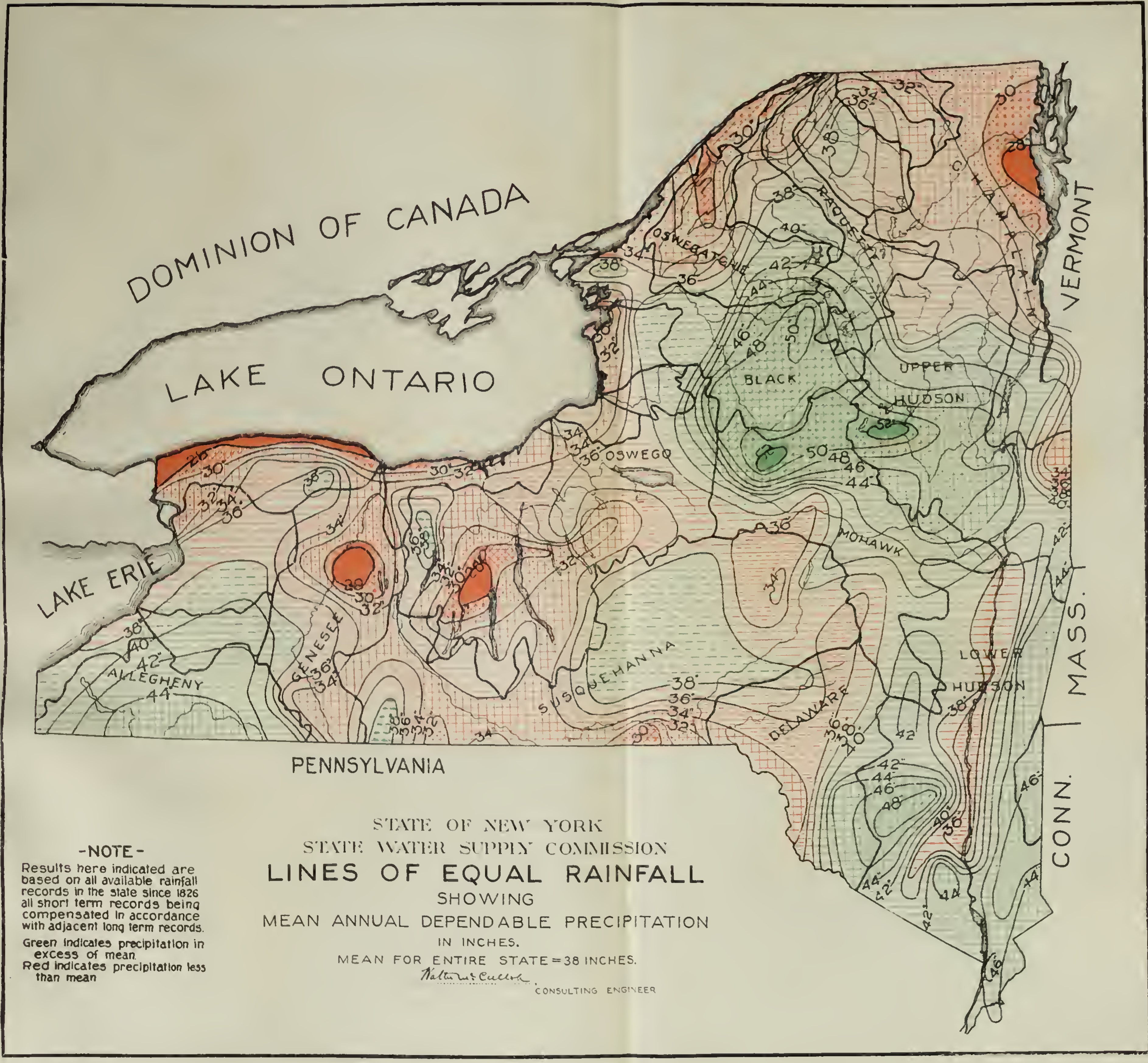
In this plant, illustrated on plate 14, the water is pumped into a system of sprinkler pipes about two or three feet above the ground and is sprayed over the vegetables and berries with the result that an eminently satisfactory increase in the value of the crop has been realized. In addition to the test with vegetable beds, a peach orchard has been irrigated by open ditches with the result that the fruit has been more abundant than in previous years and a better price obtained for it.

It is believed that there is a large field in this State for the development of irrigation systems for the improvement of farm lands which now suffer greatly from drought in the summer season, and a much greater opportunity for the development of small water powers, thus taking advantage of small streams and making them serve the farmer with light, heat and power. But this is a matter for private enterprise and we believe that when the possibilities are realized advantage will be taken of them.

HYDROGRAPHIC WORK.

The stream gaging and rainfall observation stations described in our report of 1909 have been maintained as usual and eight new stream gaging stations and ten rain gaging stations have been established. Since the first of May, 1910, the hydrographic work has been consolidated and improved by bringing both branches under one supervising head in accordance with an agreement made with the United States Geological Survey and the United States Weather Bureau, whereby Mr. C. C. Covert, District Engineer, United States Geological Survey, should have direct charge of all stream gaging and rain gaging stations being maintained in cooperation with these Departments. Mr. Covert's headquarters having been established in Albany, this plan has put us in closer touch with his department and has expedited the work and the receipt of results from the various records.

Considerable time and expense has been devoted to the establishment of two high grade stream gaging stations, one on the Sacandaga near Hadley, and the other on the Genesee river at St. Helena. These two stations have been equipped with a cableway for gaging, and with automatic self-recording instruments for keeping continuous records of the rise and fall of the river. On the Sacandaga, the site for the station having been selected with great care, the boulders and rough places in the river bed were removed by blasting so as to obtain as nearly as possible a smooth section through which the water would flow without obstruction, and produce conditions as nearly ideal as possible for stream gaging. A concrete well was constructed on the bank covered with a shelter house, in which has been installed the self-recording instruments and gages. This station was completed early



STATE OF NEW YORK
STATE WATER SUPPLY COMMISSION

LINES OF EQUAL RAINFALL

SHOWING
MEAN ANNUAL DEPENDABLE PRECIPITATION
IN INCHES.
MEAN FOR ENTIRE STATE = 38 INCHES.
Walter McCulloh
CONSULTING ENGINEER

-NOTE-

Results here indicated are based on all available rainfall records in the state since 1826 all short term records being compensated in accordance with adjacent long term records.

Green indicates precipitation in excess of mean.
Red indicates precipitation less than mean

in November and promises to furnish more accurate records and results than has heretofore been possible on the Sacandaga river. The station established on the Genesee river is prepared in the same manner as that on the Sacandaga, and the same class of records is anticipated from this station.

These two new stations will prove of great value in the event of the construction of storage reservoirs on the respective streams, because with them it will be possible to determine the normal flow of the stream previous to the creation of the reservoirs and thereafter to determine with a high degree of accuracy the amount of water being discharged from the storage at any time. Herewith I submit the report of Mr. C. C. Covert, District Engineer, United States Geological Survey, in which will be found a complete description of the new gaging stations, and all other work accomplished during the year in that branch of our investigation.

In response to an invitation from the director of the United States Geological Survey at Washington, your secretary and consulting engineer attended a conference held in Washington on May 31st and June 1st, for the consideration of matters relating to co-operation between the State and Federal departments and interstate co-operation in matters relating to stream gaging, rain gaging and other scientific matters of mutual interest. This conference proved of great interest and profit, and much valuable information was obtained for our use as a result of our attendance upon it.

A revised rainfall map of the State (plate 15) has been prepared from all available long time records, upon which is shown the lines and zones of equal rainfall. The mean annual dependable precipitation for the state is 38 inches. The red and green coloring on the map indicate the territories in which the annual precipitation is below and above the mean respectively.

RECOMMENDATIONS.

For the work of the Engineering Bureau during the coming year, I would respectfully recommend that the survey be completed in the Sacandaga reservoir basin during the winter months while it is possible for the men to work over the big swamp with safety on the ice. During the summer months it is practically impossible to make a survey in the Big Vly owing to the saturated condition of the ground and the rank growth of marsh grass and brush. During the winter when the ground is frozen sufficiently hard to permit, the parties can travel over the territory and the survey can be made at a great saving in cost and time. These surveys of the property lines and various farm parcels will be essential in the event of proceeding with the improvement of the Hudson river by the construction of the Sacandaga reservoir either under the present statutes or one hereafter enacted.

Studies and surveys should be continued on the Black river to complete the work undertaken in this basin, and further surveys made upon one or two other streams such as the East and West Canada creeks and the Oswegatchie river.

Power surveys similar to those made this year on the Hudson and Genesee rivers should be made on the principal power streams of the state, including the Black, Oswego, Salmon, Oswegatchie, Raquette, St. Regis rivers and East and West Canada creeks.

The studies of the present year indicate that a small amount of money can be profitably expended in further investigations on Owasco and Canandaigua lakes for the partial regulation of the Oswego river. Further studies and some surveys should be made with regard to the storage and power possibilities on the small streams.

The hydrographic work should be continued and enlarged as far as possible. This work being done in cooperation with the United States Geological Survey has been demonstrated to be of great value during the past three years, and as it is the foundation data upon which all water storage and water power development studies must be based the work should be continued without interruption in the same manner and with the high degree of accuracy as now prevails.

Respectfully submitted,

WALTER McCULLOH,

Consulting Engineer.

WATER POWER

FOR THE

FARM AND COUNTRY HOME

BY DAVID R. COOPER

Engineer–Secretary to the Commission

Scenic Cascade.

WATER POWER FOR THE FARM AND COUNTRY HOME

By DAVID R. COOPER

Engineer-Secretary to the Commission

In the course of its general investigations of the water powers of the State, the Water Supply Commission has heretofore confined its attention to the possibilities for large developments, and the regulation of the flow of rivers and large creeks. No previous or general investigation of small creeks and brooks and their power possibilities has been made, not because they were considered unimportant, but because the Commission believes that if the State decides to take an active part in the regulation of the flow of streams and the development and conservation of water powers, it should confine its first activities to the larger units, leaving the smaller opportunities for later examination and for private and individual development. However, no comprehensive system of conservation can meet with universal favor unless it contemplates the prevention of waste, great or small, and wherever found.

Accordingly the Commission desires to call attention to the valuable power which is now running to waste in thousands of small creeks and brooks in all sections of the State. Many of these minor streams present possibilities for small individual developments of power sufficient to supply all the requirements of the owner at a comparatively small cost. Numerous farms in the State have on them brooks or creeks capable of supplying power sufficient to furnish electric light for all the buildings. Others would also furnish power enough to drive a feed grinder, a churn or cream separator, or to run a wood saw, sewing machine or other machines and implements, requiring a small amount of power for their operation. In short, there are numerous small streams now tumbling over ledges in barnyards or pastures, whose wasted energy might readily be transformed and applied to useful work by the installation of small and inexpensive water power plants. If the power of more of these were developed and substituted for manual labor a great saving of time and energy would be accomplished and financial profit would result.

After the initial expense of installing the plant is paid, the cost of a small water power is inconsiderable, the plant requiring little personal attention and small expense for supplies and repairs. However, while the power of some streams may be developed at an amazingly small cost, in other instances the cost may be prohibitive. In this connection, one fact that is perhaps not fully appreciated is that the power of a waterfall is comparatively permanent, only its rate of availability being limited. While the stream may shrink in the dry summer and fall, it is quite certain to swell again in the spring and to continue the process, year after year as the source of supply is continually renewed. But the power which might have been, but was not developed in the year 1910, cannot be reclaimed in 1911 or ever after. Much of the power that is wasted by inequality of the flow of the stream may be saved by conservation through water storage; but this sometimes involves a large outlay and therefore, generally speaking, the fullest value of the power of a small stream can best be obtained by using the stream as it runs, or at best after temporary storage behind inexpensive dams.

The Water Supply Commission believes that the possibilities for small water powers should be pointed out to the people of the State in order that there may be a better realization of the usefulness and value of this remarkable natural resource and that the farmers and residents of rural districts may take advantage of the opportunities to conserve and utilize them. It is believed that some facts relating to the utility of power in general and small water powers in particular, together with descriptions of some typical small water power developments that are now in actual operation, and brief notes on the fundamental principles of such a development will suffice to bring the subject forcibly to the attention of those most interested, and furnish at least a beginning for observations in this comparatively new field. A more general utilization of this source of power would result in a saving of much energy now secured from coal, wood and other exhaustible producers of power.

Accordingly the following discussion of the many and varied uses for power on the modern farm, together with descriptions of power plants now in use and notes on developing a small water power are submitted in the hope that they may be of interest and service to those who have chosen farming for their livelihood or pleasure, and that they may assist in a consideration as to whether or not it may be worth while to develop the power of any particular stream. It seems that some practical conservation of small water powers should result.

USES FOR POWER ON THE FARM.

The impossibility of securing a sufficient number of capable and satisfactory farm hands in these days, when the majority of young men are turning to the populous centers for their livelihood, is perhaps the most compelling reason why machines which can be substituted for manual labor are a decided advantage to the up-to-date farmer. Their adoption as a part of the permanent equipment for the farm renders their owner comparatively independent of the problem of supply and demand for farm labor, the solution of which problem is an important factor in determining the success or failure of the farmer who disposes of his produce in open market. This condition is supplemented by a commendable tendency for farmers to live better, to place the home life of the farm on a higher plane, and to make farming a means of pleasurable livelihood rather than to content themselves with merely eking out a bare subsistence from the products of the soil. These conditions, together with the greatly improved quality of illumination and convenience which electricity affords, are creating a growing demand for a reliable and reasonably economical source of energy with which to supply both light and power on the larger estates and farms. That electric light is much cleaner and more convenient than kerosene lamps must, of course, be admitted by all. It must also be admitted that a kerosene lamp of any considerable illuminating power has also certain heating propensities which render it an unpleasant companion on a warm summer evening. However, when it comes to a consideration of mere dollars and cents, there seems to be a widespread belief that kerosene, as a source of illumination, is cheaper than electricity. Statements to this effect are too often allowed to go uncontradicted, and too many people accept this view without taking the trouble to investigate.

It is a comparatively simple matter to compare the cost of the two kinds of light, knowing as we do exactly how much current an electric lamp, of a certain filament and candle power, will consume. Such a comparison will frequently result in a choice of electricity as the cheaper light. In many cases the selection of electricity to supplant kerosene lamps would result in no considerable saving of money, but would do away with considerable inconvenience and furnish much better illumination. If cost is the controlling consideration, the comparison cannot always be so much in favor of electricity. An important consideration, often overlooked, is that with electric lights the interiors of living rooms do not require such frequent papering or refinishing as they would require with kerosene illumination.

However, the convenience and cleanliness of electricity are fairly well known and appreciated, but the means by which electric currents may be generated economically, and by which this form of energy may be applied to bring about sufficient returns, financial and otherwise, to warrant the installation of an isolated plant for a farm or country home, are not so generally understood.

Electric current may be generated by means of a dynamo or generator with any kind of a power producing plant. All that the dynamo requires to enable it to produce electric current is power of some kind that may be applied in such manner and quantity as will cause the armature, or "interior core" of the machine to rotate at a sufficiently high rate of speed. There are various kinds of power generators which will perform this work satisfactorily for isolated plants. Within the last few years the small internal combustion engine, supplemented by the electric storage battery, for stationary service, have been so much improved and simplified as to cause them to compare very favorably with the better known types of power producing apparatus in first cost and in reliability of operation. The extreme simplicity of both this type of engine and of the storage battery, together with the great economy in fuel consumption of these engines, the low price of fuel, and the efficiency of the battery as a device for storing the energy and delivering it in the form of electric current when needed and in the quantity required, result in a low operating cost. The advent of tax-free alcohol into the field of available fuels for use in internal combustion engines and the growing demand for this class of fuel, indicate that it will become, in time, a strong competitor for kerosene and gasolene. At present, gasolene is the most generally used fuel for engines of this type and small sized gas engines are now manufactured by many firms.

Steam power is probably the best understood of all classes of power. In many cases, especially where the fuel is very cheap, this is the best power for a farmer to have. Steam power plants as well as gasolene, kerosene and alcohol plants all require personal attendance during operation and necessitate more or less frequent applications of fuel. Wind power is also a source of energy, which may well be considered by the farmer who needs a small amount of power.

Perhaps the most promising source of power for farmers in New York State is the power that may be developed from falling water. This kind of a power plant requires comparatively little personal attention while in operation, and needs no replenishing of fuel except such as nature herself provides in the flowing brook. Not only are there many of these power sites that are undeveloped as yet, but there are many others which have been developed at some previous time and have recently been allowed to fall into disuse for various reasons. Many old saw mills were abandoned when the surrounding hills were all lumbered off. A small investment would enable many such old powers to be revived and applied to some useful purpose. Such a water power plant could frequently be made to serve the owner or a group of users of electric current at very small first cost for each individual, and at an operating cost which would be inconsiderable.

It should be borne in mind, however, that much depends on the choice of the best power for any particular purpose and a careful consideration of what is needed, and the conditions under which the power must be supplied, is essential to insure satisfaction with a power plant. In any particular instance a manufacturer of small water wheels will cheerfully submit an estimate for a water power plant, while the makers of steam and gasolene engines will quite as readily furnish any information, to be based on data furnished by the intending purchaser.

The extent of the applications of power to practical purposes on the farm is very broad. While perhaps electric lighting is the use most frequently thought of, it is, however, in the application of electric current or power to the operation of labor saving devices that the greatest gain is to be derived on the large farm or country place. Feed grinders, root cutters, fodder cutters, fanning mills, grindstones, circular saws, corn shellers, drill presses, ensilage cutters and elevators, horse clippers, milking machines, grain separators, threshing machines, cream separators, churns, vacuum cleaners, ice cream freezers, dough mixers, feed mixers, chicken hatchers and numerous other machines and implements operated by power, are obtainable in these days of labor saving devices. The amount of power required to operate many of these is small. The presence of a plant of sufficient capacity to operate one or two particular machines often makes it possible to use the power for many of the other purposes. The amount of work that a small amount of power will do may be judged from the following brief statements of what is actually being done with existing plants.

Six horse power will drive a grain separator and thresh 2,500 bushels of oats in ten hours.

Three horse power furnishes all power needed to make 6,000 pounds of milk into cheese in one day.

Six horse power will run a feed mill grinding 20 bushels of corn an hour.

Five horse power grinds 25 to 40 bushels of feed, or 10 to 12 bushels of ear corn an hour.

Seven horse power drives an 18-inch separator, burr mill and corn and cob crusher and corn sheller, grinding from 12 to 15 bushels of feed an hour, and 5 to 8 bushels of good fine meal.

Six horse power runs a heavy apple grater, grinding and pressing 200 to 250 bushels of apples an hour.

Five horse power will drive a 30-inch circular saw, sawing from 50 to 75 cords of stove wood from hard oak in ten hours.

Six horse power saws all the wood four men can pile in cords.

Twelve horse power will drive a 50-inch circular saw, sawing 4,000 feet of oak or 5,000 feet of poplar in a day.

Ten horse power will run a 16-inch ensilage cutter and blower, and elevate the ensilage into a silo thirty feet high at the rate of seven tons per hour.

One horse power will pump water from a well of ordinary depth in sufficient quantity to supply an ordinary farmhouse and all the buildings with water for all the ordinary uses.

In determining the size of power plant required in any particular instance the use requiring the largest amount of power must be considered. It follows that there will then be plenty of power for the smaller requirements. In considering a water power it should also be borne in mind that the full theoretical amount of a water power can never be realized, a certain portion being taken up in friction in the water wheel and in losses in the electric generator, transmission lines, motors, etc. The question as to how much may be made available will be discussed hereinafter.

Following are descriptions of some typical water power developments in use in this State at the present time.

FARM WATER POWER DEVELOPMENT IN ONEIDA COUNTY.

On the outskirts of the village of Oriskany Falls, in Oneida county, N. Y., is a farm of about one hundred acres, belonging to Mr. E. Burdette Miner. This community was at one time one of the principal hop raising districts of the State. Mr. Miner has been engaged in raising hops for fifty years, and raised 10,000 pounds of hops on seven acres the past season. In recent years he has divided his attention between mixed farming and dairying, keeping from twenty to twenty-five cows.

Before the installation of his water power, not the least of the irksome tasks about the farmhouse was the daily filling and cleaning of kerosene lamps and lanterns, and the wood was sawed, and the cream separator and churn in the dairy room were operated by hand. Five sons contributed in no small measure to the prompt disposal of the daily tasks. But the boys went forth into the world and acquired lines of activity and interest of their own. Only the oldest son remained to live on the farm. Another son studied electrical engineering, a third chose mechanical pursuits, a fourth became a civil engineer, and the fifth took up commercial work. After coming in touch with the outer world and the great modern achievements of science and invention, especially of a mechanical or engineering character, the boys quite naturally set their wits to work to devise some way that the daily labors of those at home might be made less burdensome.

Through the farm flows Oriskany creek, which ripples over its gravelly bed in a channel from twenty to thirty feet wide. The boys said to their father, "Why not harness the creek and make it do some of the work?" There was no precipitous fall of the creek on the farm, but the boys proposed to concentrate at least a portion of the fall by constructing a dam. This they intended to do primarily for the purpose of developing enough power to light the homestead and farm buildings with electricity and to saw the wood and do away with some of the other tiresome farm tasks.

The elder Miner was not enthusiastic at first, but was finally persuaded by the boys, who made surveys and plans for a water power development, and in October, 1905, with the assistance of three of his boys and two day laborers, Mr. Miner began the construction of a dam across the creek. This was to be no ordinary structure. The creek, while peaceful enough at most times, had a habit well known to Mr. Miner, of bursting its bounds every spring and rushing through the farm in a torrent. So the dam was built in such a way that, while it would raise the water to a certain height during periods of ordinary flow, it would not cause the floods to rise perceptibly higher than before the dam was built. Accordingly it was designed so that a part of it could be lowered at flood times to allow free passage for the swollen stream.

The bed of the stream at the site selected for the dam is composed of solidly packed gravel. It was not considered advisable to lay timbers directly on such a foundation, so a ditch about two feet deep and one and one-half feet wide was dug across the creek bed and filled with concrete, to which a heavy timber was securely bolted, to form the upstream sill for the superstructure. The downstream side was supported on a sill of heavy timber whose ends were imbedded in the concrete walls or abutments at either end of the dam and whose middle portion was supported by posts spaced six feet apart, which in turn rested on large blocks of concrete placed in the bed of the creek. This downstream sill was about two and one-half feet higher than the upstream sill. A horizontal floor of double plank extending twelve feet downstream from the upstream sill and supported by the concrete foundations under the downstream sill formed an apron for the water to fall on.

This prevents back washing under the dam. A double layer of heavy plank was then fastened on the two sills, forming a sloping face on the water side of the dam. On the upper edge of this plank-facing at the crest of the dam, are placed flash boards, one foot high and extending the full length of the dam, thirty-six feet, but divided into six sections, each six feet long. Each of these sections is hinged by the lower edge to the crest of the dam, while the upper edge is held from tipping over by chains fastened to cast iron lugs located about halfway down the planking. The chain is held in these lugs by pins which are connected by rod and chain to a capstan or spindle located at one end of the dam and are so arranged that by turning the spindle the pins will be drawn successively, thereby letting the flash boards down one at a time. The idea of this arrangement is that when a flood is rising the capstan may be turned with a heavy lever crank, winding up the chain and pulling down the flash boards, one at a time, to give more space for the flood to pass over so as to prevent the water upstream from the dam from rising too high. This plan has prevented the washing away of Mr. Miner's power house on several occasions.

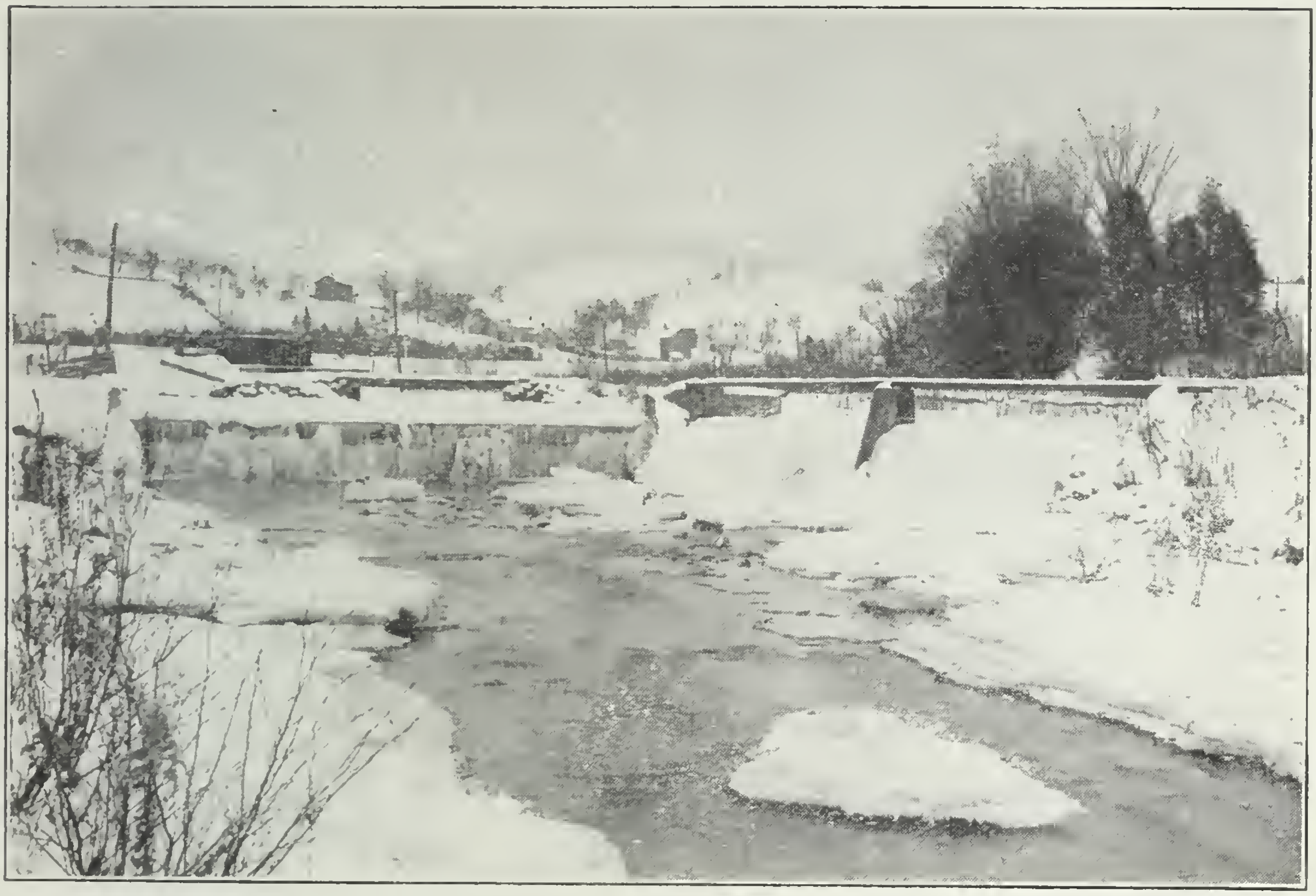
The sloping face of the dam receives the direct pressure of the water and transfers it to the sills which in turn transfer it to the foundation. The reason for sloping the upstream face of the dam is that the pressure of water is always normal or perpendicular to the surface against which it presses, therefore, if the face of the dam is sloping, the pressure is downward, rather than outward as would be the case with a vertical face. This results in greater stability for the dam, due to the lessened tendency to tip over. With a dam of this type the higher the water rises against or over it, the more nearly vertical is the line of pressure. and the dam is held tightly down on its foundation instead of tending to tip over. It follows that the flatter the face of the dam the more stable it will be. Mr. Miner's dam, with the flash boards up, raised the water about four feet.

But in spite of his provision for floods, Mr. Miner did not want to be under the necessity of letting down his dam for every freshet, nor did he care to risk the damage that might result from an unusual flood, so he provided an additional permanent spillway. This is a simple concrete barrier or wall which flanks one end of the dam. In plan it was built at an angle with the dam proper, and extends down stream along the side of the natural bank. It was built with its crest four inches higher than the main dam, so that during periods of ordinary flow the surplus water all passes over the main dam, but as soon as the creek rises a few inches over the main dam, water begins to flow over this extra spillway, which being about forty feet long will discharge a considerable volume although the water flowing over it is only a few inches in depth.

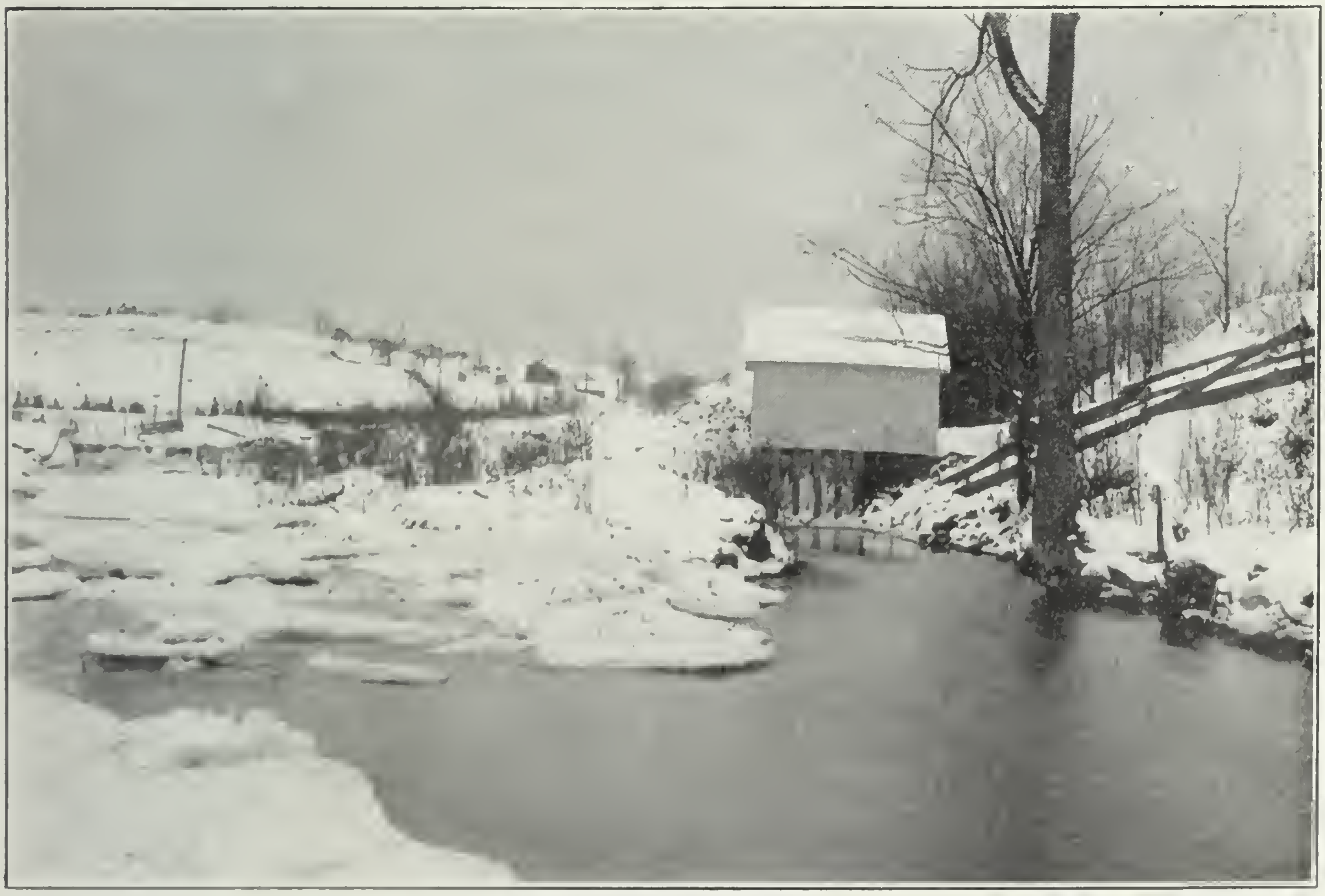
This spillway is strengthened on the downstream end by a concrete abutment, which consists of a heavy block of concrete extending forty-two inches above the spillway. A similar abutment flanks the upstream end and also constitutes an abutment for one end of the main dam. The other end of the main dam is set against the opposite bank of the creek and is protected from washing and is strengthened by a similar concrete abutment.

It was considered desirable to place the little power house away from the main channel of the stream so an earth embankment was built extending from the downstream end of the flood spillway a distance of about sixty feet. This embankment or dyke is three and one-half feet higher than the main dam and is curved in such manner as to divert the water behind it across a low place to a safe distance from the main channel. Some excavating had to be done behind this embankment in order to secure a channel of sufficient depth to prevent the water from freezing to the bottom, and to provide a smooth channel of approach to the power house. This diversion of the water to one side from the main channel prevents the accumulation of debris and silt, which is a hindrance to the proper operation of a water wheel. The pool thus formed is called a "forebay" and is very quiet water. The velocity of the water flowing through it is so slight that it will not carry much debris.

At the downstream end of the forebay the diverting embankment approaches a steep bank. At this point Mr. Miner built a small power house. Under the power house is the wheel-box which consists of a box-like compartment having one side open to the forebay. This opening is covered with a coarse screen-rack to prevent leaves or other debris from entering the wheel, but the water



DAM OF E. B. MINER, ORISKANY FALLS, N. Y.
Main dam at left; flood spillway at right.



FARM POWER HOUSE ON ORISKANY CREEK.
Dam in left background; tail-race in right foreground.

flows through it readily. In the wheel-box a water wheel of the type known as a turbine, was placed. This revolves on a vertical shaft or axle, which is guided by bearings in a metal case surrounding the wheel and resting on the bottom of the box-like compartment. The wheel case is open at the bottom to allow the free escape of the water after it has passed through the wheel. The construction of the turbine is such that the pressure of the water on the curved vanes, causes the wheel to revolve, just as the pressure of wind causes a windmill to revolve. The water must have a free escape from the opening in the bottom of the wheel case and wheel-pit, and to provide for this a channel called a " tail-race," was excavated to carry the water rapidly back to the creek. Natural conditions were favorable here and a tail-race joining the main channel about 100 feet below the power house was constructed with little difficulty. At the point where the tail-race joins the creek the elevation is two feet lower than the power house so there is little tendency for water to back up from the creek into the tail-race. There is a certain amount of back-water during freshets but the increased height of the water in the forebay at such times partially offsets it.

The vertical shaft of the turbine extends up through and about two feet above the floor near one end of the power house, where it is supported on ball bearings which enable it to be revolved with very little friction.

At the other end of the power house which is twelve feet by sixteen feet in plan and seven feet high to the eaves, was placed an electric generator or dynamo, rated at 12½ kilowatts, which is equivalent to about 17 horse power. This machine is intended to operate at about 1,100 revolutions per minute. The water wheel under the pressure of about six feet would not revolve at such a high rate of speed. It was, therefore, impracticable to connect the generator shaft directly to the water wheel shaft and it became necessary to magnify the revolutions by connecting the two shafts by belt, using different sized pulleys. A large wooden pulley seventy-six inches in diameter was keyed on the end of the water wheel shaft. A much smaller pulley, about eight inches in diameter, was placed on the driving shaft of the generator. A leather belt connects the two and since the wheel shaft is vertical and the generator shaft is horizontal it is necessary to pass the belt over an intermediate pulley, or "idler." This idler is set with its axis at an angle with both the horizontal and vertical so that the transition of the belt from the horizontal to vertical is made gradually. Since the driving pulley on the generator shaft is so much smaller than the pulley on the wheel shaft, for every revolution of the wheel shaft there are about nine revolutions of the generator shaft.

The amount of power which this equipment will generate depends to a considerable extent upon the amount of water flowing. Oriskany creek at this point has a tributary drainage area of about fourteen square miles and the flow required to drive the turbine to full capacity is about 2,900 cubic feet per minute. This volume is probably available during most of the year but is not available in the driest seasons at which times the flow is probably reduced to about 600 cubic feet per minute. The water wheel probably has an efficiency of about 80 per cent., that is, it will probably develop about 80 per cent. of the theoretical energy of the falling water. The remainder is lost in friction in the wheel-box at the entrance to the wheel and in the velocity still remaining in the water after it leaves the wheel. Five per cent. of the power generated on the wheel shaft is probably lost by friction of the belting so that about 76 per cent. of the theoretical power of the water is probably delivered to the shaft of the generator.

Mr. Miner realized that there would be times when he would not require all or any of the power which would be produced. At the same time the pond formed by the dam was not large enough to store any considerable amount of water and he had all the power he would require at any one time, so it was not considered necessary to provide storage batteries to store the electricity. On the other hand he did not wish to be compelled to turn the water on and off at frequent intervals. Therefore, it was decided to provide for the plant to run continuously. This necessitated devising some means to consume the electric current when not in use. A series of resistance coils were mounted on a frame work in the power house, and connected with the generator. When the supply of electric current exceeds the demand, a small electric device automatically throws one or more of these coils into the circuit, and the surplus current is consumed in friction and converted into heat by the resistance of the coils. By means of this arrangement it was planned to run the plant continuously so that whenever electric current was wanted it could be had simply by turning a switch at the house or barns.

The power plant, including the dam and all the features thus far described, was completed and in operation before Christmas of the year in which the construction was begun.

We have thus far seen how Mr. Miner developed his water power and transformed it into electricity. It remains to see how he gets it to his house and farm buildings and how he uses it after he gets it there.

The power house is situated about 1,700 feet from the house, where the electric current was most wanted. This necessitated the construction of a transmission line. For this purpose a double line of bare aluminum wire was stretched on a line of poles about twenty feet high and about one hundred feet apart. The poles are provided with ordinary crossarms at the top on which are mounted the insulators carrying the wires. As the transmission line leaves the power house it crosses a highway and runs in a perfectly straight line to the house. Over the highway insulated wires were used as a safety precaution but bare aluminum wire was used for the remainder because it was cheaper.

The buildings are all in a cluster and a branch from the transmission line runs into each one where the current is used. All the wires which are inside of any of the buildings or are close to the woodwork, are covered with insulation and where concealed are further protected by flexible metallic conduits or pipes.

The first actual use of this hydro-electric power was for lighting. The house was illuminated with electric lights, as were also the barn and other buildings, there being ultimately about seventy sixteen candle-power lamps in use. Even the pig sty has its electric light and there is no more groping in the dark anywhere about the Miner farm buildings.

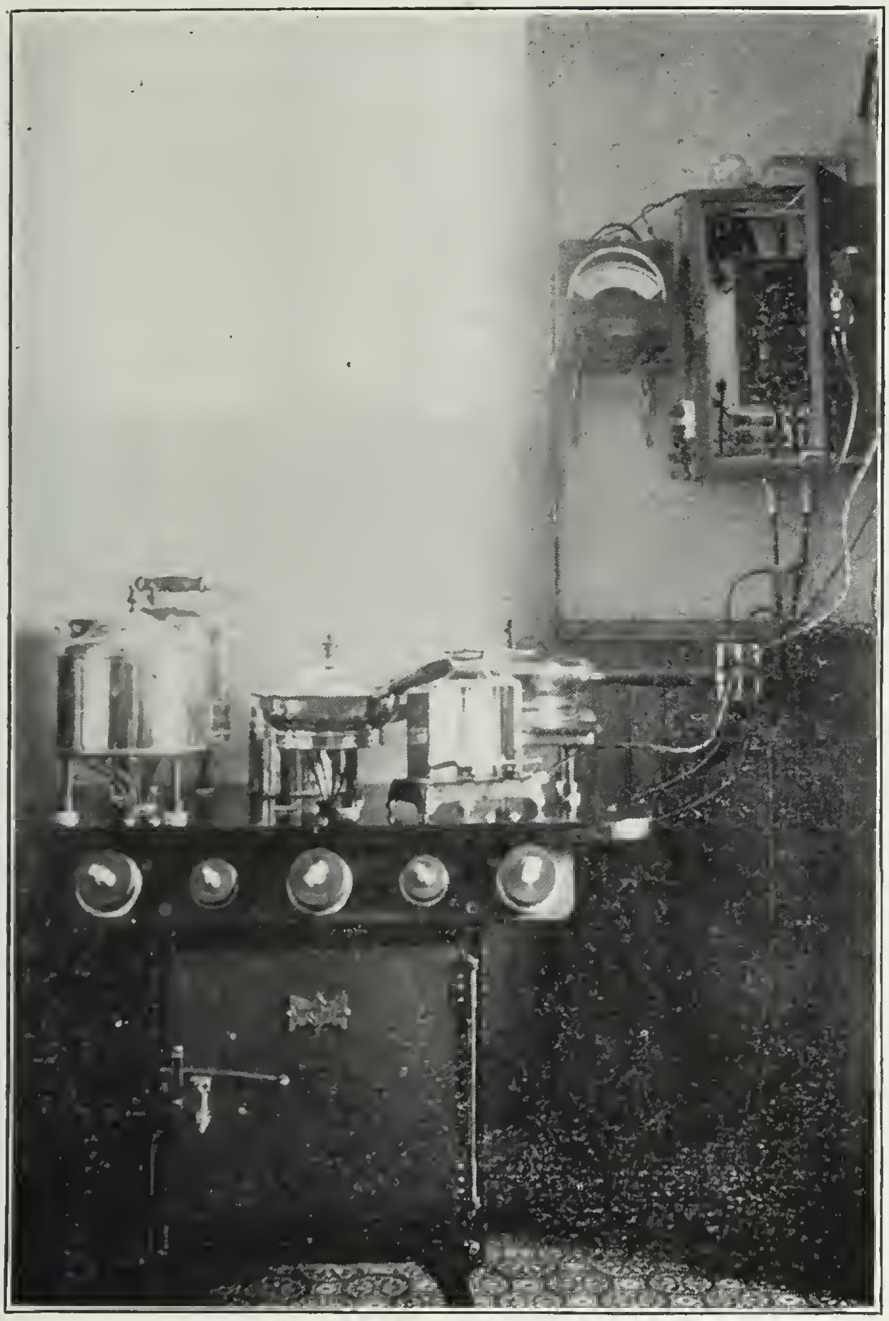
But there was more power in the creek than was necessary to run the electric lights. A circular saw was brought into use, belted to a motor, and the supply of fire wood was cut in a fraction of the time previously required. The same motor is used to drive a lathe, drill, grinder and buffer in a machine shop which the Miner boys built and equipped This motor is belted to a countershaft from which additional machine tools can be driven. One of the Miner boys has developed this machine shop as a combined means of pleasure and profit. In addition to a considerable amount of experimental machine work, he does all the farm repairs and a considerable amount of machine work for neighboring knitting mills, as well as general and automobile repair work, all of which has been made possible by the harnessing of the creek.

Another motor, two horse power, driven by the electric current, is belted to a vacuum pump which is connected with a 1-inch pipe running to the house and the barn. In the house there are two taps, one on each floor, to which the hose of a vacuum cleaner may be attached, and Oriskany creek does the rest; the floors are cleaned in the most modern, sanitary and thorough manner. In the barn the pipe from the vacuum pump runs above the cow stanchions with a tap at alternate stanchions. The tubes of the milking machines are attached and the creek milks twenty or twenty-five cows twice each day.

In the dairy room is a one-half horse power motor, which may be belted to the cream separator or churn, and on the hot summer days it is frequently belted to the ice cream freezer. An ingenious float device in the separator turns off the power when the cream is all separated from the milk and trips a can of clear water into the heavy revolving bowl of the separator, which still retains enough momentum to rinse itself thoroughly before coming to rest.

In a similar manner other applications of the power have followed from time to time and one at a time most of the hand cranks on the Miner farm have been relegated to the scrap heap; even the grindstone is operated by a rope belt run from the little motor in the dairy out through the door to an adjoining compartment.

In the Miner residence are five electrical heaters, which Mr. Miner states will raise the temperature to 75 degrees when it is zero outside. Since these heaters were installed there has not been much use for the wood saw. There are also in the house some electric fans which stir up a breeze on the hot days. An electric ventilator fan in the attic insures cool sleeping rooms on hot summer nights and good ventilation at all times. In the



Electric Cooking Outfit, E. B. Miner's Home.

Modern Application of Hydro-electric Power; Vacuum Milking Machines.

kitchen the Miners cook for a family of from five to ten with an electric range, and iron with an electric iron, attached by a cord to an ordinary electric lamp socket. A small motor operates the egg beater and cream whipper. Another small motor drives the sewing machine.

The little motor in the dairy room also drives a single acting plunger pump which forces water up to a galvanzed iron tank in the attic of the house, whence water is piped and furnished by gravity to the bathroom and kitchen. An electric heater in the kitchen heats the water for the bath and kitchen.

Other miscellaneous uses are made of the never failing power of the creek, such as filling the silo, and the power plant requires practically no attention. Self-oiling devices on the water wheel and generator and the use of the resistance coils to consume superfluous electric current obviate the necessity for attention, except to fill the oil cups every few weeks. Practically no trouble has been experienced in the operation, the only interruption so far being due to the formation of anchor ice in the forebay and screen racks, which causes a little trouble on extremely cold days. The water wheel is run continuously night and day, summer and winter, and electric light or current is always available at the touch of a button or by throwing a switch.

As to the cost of his plant Mr. Miner would give no figures. His motto seems to be "Not how cheap, but how good?" and he states that it would require several times the cost to induce him to give up his water power plant. The cost of reproducing his power plant, including the dam, power house, water wheel, generator and transmission line, is estimated at about $1,800.

SUMMER HOME POWER PLANT, NORTHWEST BAY, LAKE GEORGE.

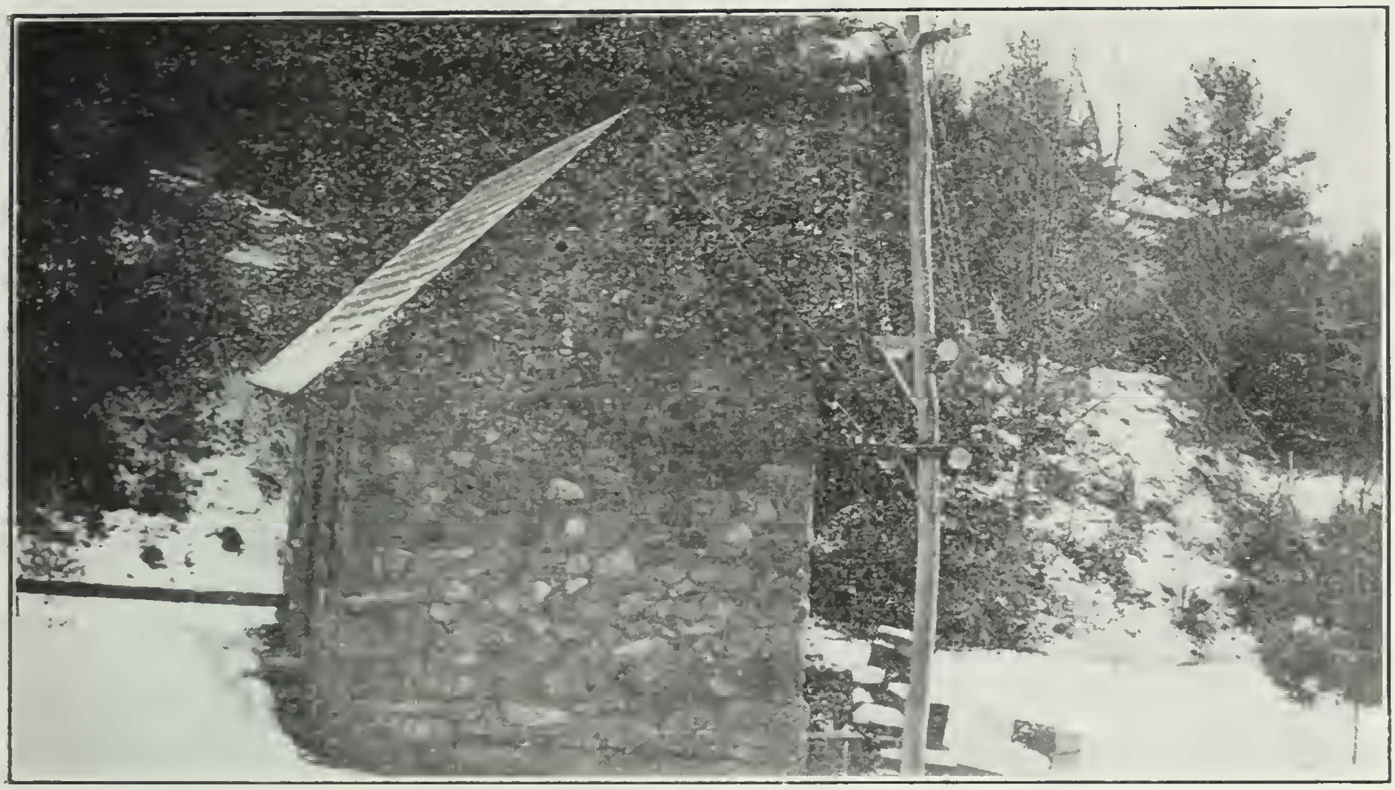
Among the attractive summer homes on the shores of Lake George, is that of Mr. Stephen Loines of Brooklyn, located at the upper end of Northwest bay about four miles above Bolton Landing. On his property there was a small lake known as Wing pond, having an area of about seven acres and situated at an elevation of about 180 feet above Lake George. The outlet was a small brook which runs through Mr. Loines' property and flows into Northwest bay.

In the summer of 1902, Mr. Loines built a dam across the outlet of Wing pond, raising its surface about two feet. He ran a galvanized iron pipe line from the dam down the side of the hill and along the brook. It was four inches in diameter for a short distance, then reduced to three inches and finally to two inches, and was about 1,200 feet long in all, with a fall of about 110 feet. A 24-inch water wheel of the impulse type was installed in a small power house to which the pipe line was run. The water wheel developed about three horse power and was belted to an electric generator.

The power was found to be insufficient to supply Mr. Loines' needs at that time. He desired to burn thirty-five 16-candle power carbon filament lamps and to charge a 40-cell battery for an electric launch.

Accordingly, in the fall of 1908, Mr. Loines raised his dam two feet higher and installed a 6-inch spiral riveted steel pipe line running from the dam down a gulley on the surface of the ground, for about 1,600 feet, to a point a short distance from the place where the creek flows into Lake George. At this point he built a small power house and installed a 24-inch water wheel of the impulse type. This wheel operates under a head of 165 feet and is directly connected by a shaft to a 6½-kilowatt generator which operates at 500 revolutions per minute. This generator supplies a 60-cell house battery (45 lamps), an 84-cell battery for a 35-foot cabin launch, a 48-cell battery for a 20-foot open launch and a 40-cell battery for an electric roadster, all of which are in pretty continuous use from about the first of June to the first of November of each year.

As this new development superseded the older one and proved entirely adequate for the needs of Mr. Loines' country place, the old development was made over so that it could be utilized for sawing fire wood to supply the superintendent's cottage and the other buildings during the winter. A countershaft was erected on the wall of the old power house, which is a building 7 feet by 10 feet in plan and about 8 feet high. This countershaft has three counter-pulleys, by means of which the speed of the water wheel may be doubled or trebled. For the purpose of sawing fire wood a leather belt is placed on one of the pulleys of the countershaft and run



Stephen Loines' Power House, Northwest Bay, Lake George.
At left, 4-in. water pipe: at right, transmission line connection.

Power Transmission Line, Northwest Bay, Lake George.

through a small aperture in the side of the power house to the driving pulley of a circular saw which stands on a small porch at one end of the power house building.

Mr. Loines' superintendent stated that by operating the saw continuously for eight hours it would be possible to saw twelve cords of wood, which he estimated to be sufficient to supply his cottage and such other of the buildings as need wood, for the entire winter. This illustrates very aptly the large amount of work that a small power is capable of doing in a short time.

In addition to lighting his house and buildings by means of the power developed at his new power house, Mr. Loines also has a rather unusual application of power on his summer place. He is an enthusiastic student of astronomy and has built a small but elaborately equipped observatory on the hillside above the cottage. The observatory is so constructed that the roof can be removed entirely from the building to a support at the back of the observatory. The roof is mounted on wheels and Mr. Loines uses his electric power to do the work of moving the roof when he wishes to make astronomical observations with his telescope. This is accomplished by means of a small 1½ horse power motor which operates at 1,275 revolutions per minute and is connected by belt to a countershaft, which in turn is connected by a worm gear and a chain drive to the carriage on which the roof is supported. In this manner the roof may be moved the required distance in two or three minutes by simply throwing the switch which is inside the observatory building.

Mr. Loines' new power house is a stone masonry building, the masonry being uncoursed rubble constructed in a very artistic and attractive manner. The building is 9½ feet by 15½ feet in plan and is about 9 feet high to the eaves. It has a concrete foundation and the floor is of first class concrete. A concrete foundation about 3 feet by 5 feet provides a permanent support for the water motor and the generator. This foundation projects six inches above the level of the concrete floor. On one end of the foundation stands the water wheel, there being an opening about 8 inches by 18 inches through the concrete base under the water motor to carry off the water after it has passed through the wheel. The supply pipe for the water wheel enters the side of the building on a level about one foot above the floor. Just inside the pipe reduces to a diameter of about two and one-half inches and is fitted with a gate valve by means of which the water may be turned on or off. The nozzle of the water wheel is also equipped with an adjusting device by means of which the size of the jet issuing from the nozzle may be varied in order to secure various speeds or the maximum efficiency of the water wheel. The setting required to give the desired speed is determined by experiment by the operator.

FARM POWER DEVELOPMENT IN SCHOHARIE COUNTY.

At the entrance to the driveway approach to the farm house of Jared Van Wagenen, Jr., at Lawyersville, Schoharie county, N. Y., stand two large stone gateway posts. On the cap stone of one of these posts is engraved "Agriculture the Oldest Occupation" and on the other "Agriculture the Greatest Science." In keeping with the latter sentiment, Mr. Van Wagenen has conducted his agricultural operations in such a manner that he is looked upon as one of the most scientific and progressive agriculturists in the State. He takes an active interest in such affairs as farmers' institutes and is considered an authority on the science of agriculture. His farm and buildings are equipped with the most modern conveniences and labor saving devices.

There is a small stream which runs through the farm and flows into the Cobleskill. This stream is so small that one may easily step across it in the summer time. About half a mile from the farm house is an old mill dam which forms a pond with an area of more than an acre. The dam was built long ago when small saw mills dotted that section of the State. The timber having been practically all cut off, this mill, along with hundreds of others, was abandoned. Mr. Van Wagenen conceived the idea of harnessing its wasting energy and making it do some of his farm work for him. The story of how he accomplished this is best given in his own words, as follows:

"About eight years ago I began to figure on how to get this power to the house where it could do a little work. My first thought was to carry it there by belt cables, but figures proved that the friction would eat up the five horse power available. Electric power, easily transmitted with little loss, was the only solution.

I talked with many who understood electricity and its engineering features and most of them laughed at the idea of such a small installation. Had I wanted to construct a million dollar plant there would have been whole libraries of advice; but a small plant to run entirely alone and be controlled by a seven-hundred-foot wire was evidently a novelty. After a good deal of studying and feeling my way the plans were made and the work begun.

"The stream being so small, the most rigid economy of water had to be observed, so I installed a nine-inch upright turbine in an upright wooden case, building the case myself, where it would get the most benefit of the fifteen-foot head. This turbine furnishing about five horse power, I belted to a three-kilowatt or four-horse power, one hundred and twenty-five volt direct current generator, which would easily take care of seventy-five metal filament incandescent lamps. I next installed a water wheel governor to insure a steady flow of electricity. It took about seventy-four hundred feet of weather proof copper wire, strung on wooden poles which were cut on the farm, to carry the electricity to my home and the farm buildings and to the house of a neighbor. As it is more than half a mile from the house to the plant it is out of the question to go there every night and morning to stop and start the machinery. Of course it is possible to let this plant run night and day during the wet season but in dry times it is best to save the water when the power is not needed. A neighbor living about seven hundred feet from the power station kindly starts and stops the machinery with a wire stationed at his bedroom window. This wire controls a valve and counterweight. At five o'clock in the morning he pulls the wire and the lights come on and at a certain hour of the night he releases the wire and they go out. In payment for this service I light his house and barns free of charge.

"Our maintenance charges are very small; almost negligible. I think our water wheel behaves better every year. Carbon brushes for the generator last a long while and oil is a very small item. Each year I am improving the plant, and very soon I expect to install a motor-driven washing machine and wringer to prepare the clothes for the electric iron, and to put a vacuum cleaning outfit in the house.

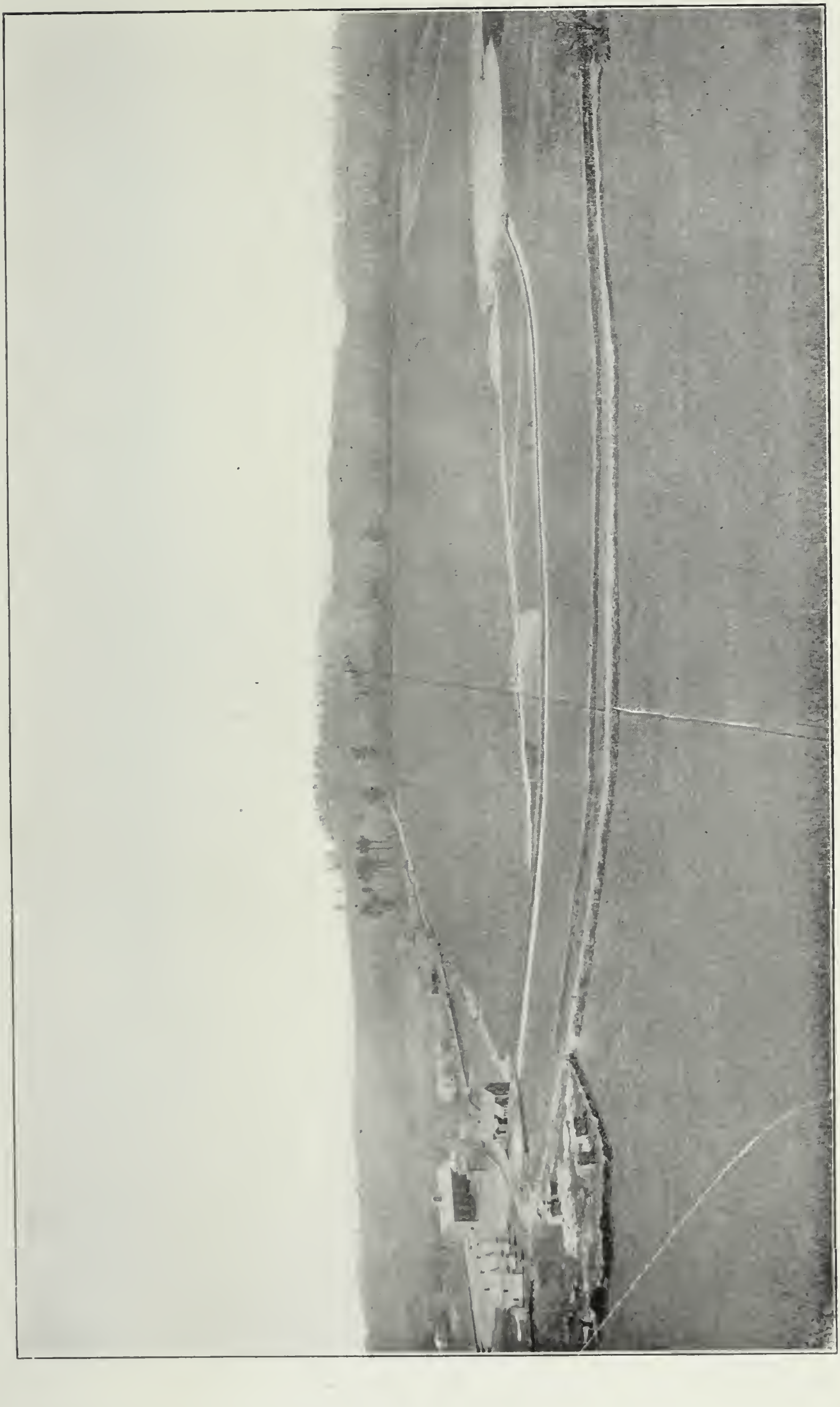
"Although I consider the cost of our plant about $500, it was installed under the most rigid economy in every respect and mainly by my own hands. The dam was already built and needed only some trifling repairs. The gate control is my own get-up, and while the cost is trifling it took considerable study to get it to work right. I did most of the house wiring, using concealed knob and tube for the living-rooms of the house; moulding and open wiring for the other rooms and for the barns. This material cost me about $40. Of course, I do not in any instance figure in my own labor as the work was all done at odd times."

This small power development using the dam already built cost Mr. Van Wagenen about $500 as follows:

Dynamo, 3 k.w. (second hand)	$50 00
Waterwheel, 9 k.w. (naked wheel)	55 00
Governor, (new)	75 00
Wire, (7,400 feet)	210 00
Labor, (installing water wheel)	40 00
Fixtures, (lamps and the like)	38 00
One small motor, 2 h.p. (new)	50 00
Total	$518 00

The plant furnishes power sufficient to light the farm house and all of the buildings with electricity as well as those of the neighbor who turns the water on and off. In the dairy a small electric motor of about three horse power, actuated by the electric current, drives the cream separator and also furnishes power for running the grindstone, feed cutters, hay fork and fanning mill, in addition to which the power is also used to milk the cows and cut the ensilage and to do numerous other bits of work about the place. Mr. Van Wagenen states that his water power does work equivalent to that of a hired man the year round and does away with numerous chores and laborious duties about the place.

The arrangement which Mr. Van Wagenen devised to turn on the water at his plant and to shut it off again is unique and interesting. It consists of a triangular frame lever about two feet wide and seven feet high, hinged at one of the bottom corners. The



Farm Power Development of John T. McDonald, Delaware Co., N. Y.

other bottom corner is connected to a flap gate which fits over the feed pipe for the water wheel. At the top are fastened two wires, one of which runs to the house of Mr. Van Wagenen's accommodating neighbor, and the other runs over a pulley and has a counterweight attached to it. When the water is to be turned on, the neighbor pulls the wire and the gate is raised by the leverage of the frame; when the water is to be shut off, he releases the wire and the counterweight pulls the lever back, allowing the gate to fall in place again.

Other Small Power Developments.

Mr. John T. McDonald, who has a farm about five miles from Delhi, Delaware county, N. Y., some ten years ago began making good use of a power development from a small stream on his farm. He lights his house and buildings, runs saws, grinders and various machines in a little shop on rainy days and in the winter. His dam was made from stone and earth from the nearby fields and cost very little. It forms a pond covering when full, about four and one-half acres of land. The pond is well stocked with trout and other fish and each winter Mr. McDonald cuts about 500 tons of ice from it. Mr. McDonald turns on the water at his dam by means of an electric switch at the house and regulates the voltage also in a similar manner. From the pond the water is led through a hydraulic race or canal about 900 feet long to one of the farm buildings where the water wheels are installed. The head, or fall, at this point is about 15 feet and there are three water wheels of the turbine type; one that develops twenty-five horse power, another that develops six horse power and a third that develops about three horse power. The large wheel is used to run a saw mill and feed mill. The six horse power wheel drives an electric generator or dynamo which furnishes the electric lights, and also electricity for driving the small motors about the place. The three-horse-power wheel runs the small saws, machine tools, etc., in Mr. McDonald's shop.

A few miles east from Mr. Van Wagenen's farm in Schoharie county is another small power development owned by Mr. Frank Casper. He has installed two water wheels on a small creek and uses the power from them to drive the machinery in a table and furniture factory. He has another small water wheel of the turbine type driving a little dynamo which generates electricity for electric light. Mr. Casper lights his factory buildings, his home, a neighboring church and the main street in the village with electricity from this little dynamo. An ingenious device of his own invention makes it possible to start and stop the power from the house, by simply pulling a wire which operates a valve in a small water pipe, from which water under pressure is let into a hydraulic cylinder. This causes the piston of the cylinder to rise and the piston being directly connected to a gate in the water pipe inlet, allows the water to flow into the water wheel. When it is desired to stop the plant, a pull on the companion wire causes the reverse operation to take place and the power is shut off.

Near the village of Berlin, in eastern Rensselaer county, N. Y., there is a small power development owned by Mr. Arthur Cowee. His source of power is a small trout brook which flows through the farm. Mr. Cowee is a producer of fancy gladiolus bulbs, on a large scale. His principal power development consisting of a 36-inch impulse water wheel under a pressure due to a fall of about 210 feet, is used mostly for the purpose of operating a circular saw and other machinery connected with a saw mill. The water is diverted from the natural channel of the brook at a considerable distance from the place where the water wheel is installed and is carried in an artificial channel about four feet wide and three feet deep around the side of the hill, where it runs into a hollow basin which has been excavated by Mr. Cowee at a suitable location. By means of this basin or artificial pond, practically all of the flow of the brook may be stored during the night and used to operate the water wheel during the day. In this manner the full power value of the brook is realized. There is a ten-inch cast iron pipe line about 1,680 feet long, which runs from the pond down the side of the hill to the water wheel. This pipe line was placed underground from three to four feet in order to avoid freezing in the winter. Mr. Cowee estimates that the development, including the diverting dam and canal, pond, pipe line, water wheel, circular saw and accessories cost him a total of about $7,000. He states that he can saw about 4,000 feet of lumber in a day with this power.

In addition to this development, Mr. Cowee also has a small impulse water wheel in his bulb house. This wheel is operated by water furnished from the system of the local water company. It is directly connected to a small electric generator which furnishes electricity sufficient for 157 sixteen-candle-power carbon filament lamps which are installed throughout the bulb house. The generator does not produce enough electric current to run all of these lights at the same time, but it will operate as many as forty-five or fifty lights at one time, which is all that is necessary to meet the requirements.

Mr. D. F. Paine, of Wadhams, Essex county, N. Y., has a dam at the outlet of Lincoln Pond. The water surface when the pond is full is about twelve feet above the normal and spreads over an extensive tract of low marshy land. The pond thus formed is about three miles long and from one-quarter to three-quarters of a mile wide. The water is conducted from the dam to the penstock, a distance of about a mile and a half, securing a fall of 320 feet. At this point Mr. Paine has constructed a power house where he generates electricity which he transmits to Mineville for use in the mines. This power is transmitted a distance of about eight miles.

At Chazy, N. Y., near the western shore of Lake Champlain and at a point about fifteen miles north of the city of Plattsburg, there is located a modern stock and dairy farm which, in its operation, exemplifies the manifold advantages to be derived from the use of hydro-electric power for electric lighting and for the various power requirements of the farm. This farm, which is owned by Mr. W. H. Miner, and is called "Heart's Delight," covers an area of 5,160 acres. About 1,200 acres are cultivated, 1,200 acres are in pasture and the remainder is woodland. The output consists of live stock and dairy products, all crops grown on the farm being fed to the stock and only finished products being shipped out. The live stock includes registered Percheron and Belgian horses, pure bred short-horn Durham and Guernsey cattle, Dorset sheep and high-grade hogs for the production of sausage, hams and bacon. There are also poultry and squabs and a fish hatchery for the propagation of trout. The entire output goes directly to high-grade hotels in New York, Washington and Chicago.

Two streams pass through the southern portion of the farm, the smaller one being known as Tracy brook and the larger one as Chazy river. It was decided to provide the farm with electricity for light and power. Enough water power was found in these streams to furnish a cheap and reliable source of energy. Accordingly a hydro-electric plant was installed several years ago, which has given such satisfaction that the equipment has been increased from time to time, and some novel applications have resulted. Three small concrete dams were built across Tracy brook to form storage reservoirs. A concrete penstock, or pipe, forty-four inches in diameter and 670 feet long carries the water from the downstream reservoir to a concrete power house where a fall of nineteen feet is secured.

The power-house equipment consists of two water turbines automatically governed and directly connected respectively to one thirty kilowatt and one twelve and one-half kilowatt, 220 volt, direct-current generators. The current is transmitted over a pole line a mile and a quarter long to a central station in the main group of farm buildings.

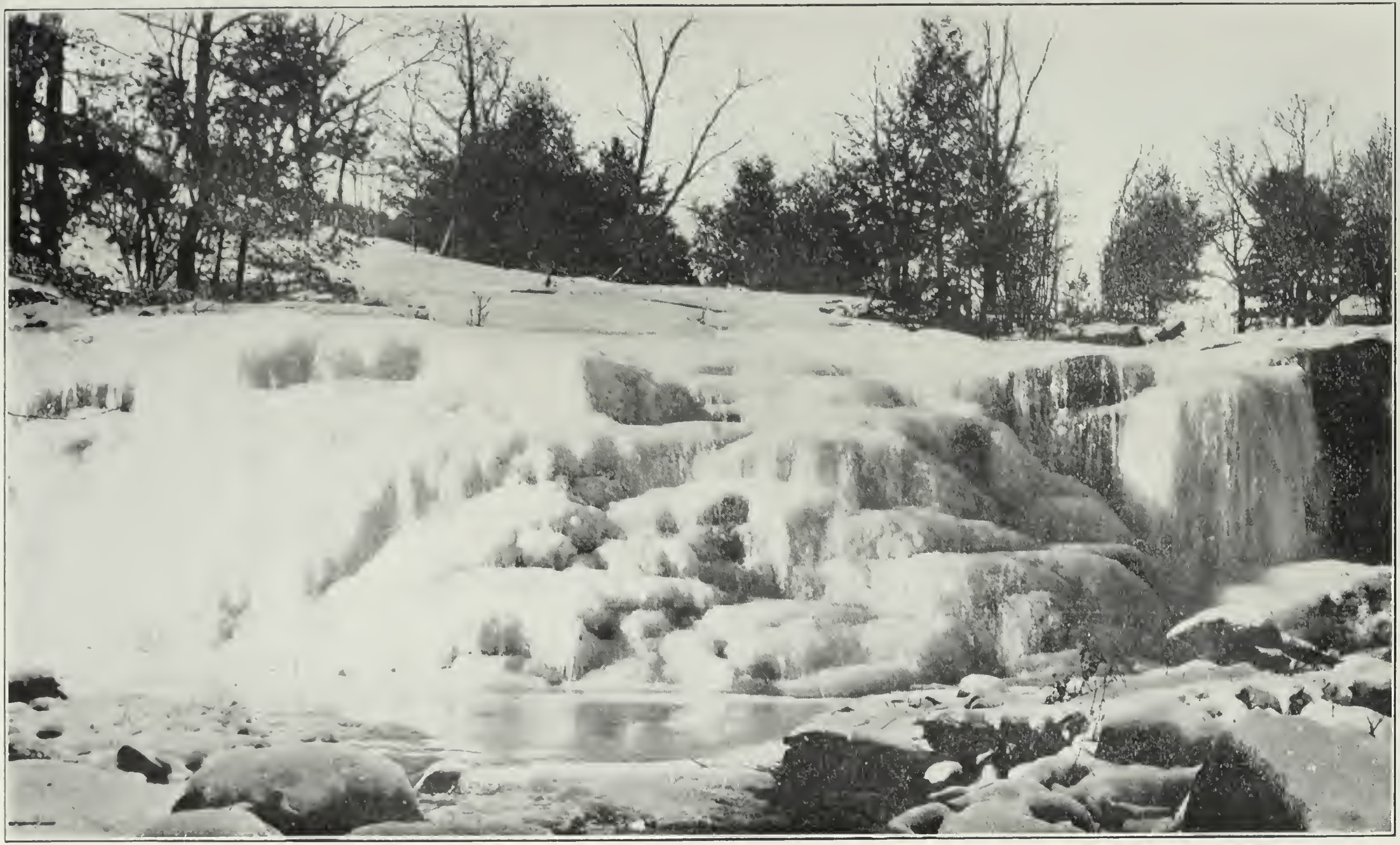
Another dam was built across the Chazy river. This is of concrete and after passing through screens at the intake gate house, built into the dam, the water flows through a concrete penstock forty-eight inches wide by sixty inches high and 630 feet long, to the power house where a fall of thirty feet is obtained. There are two turbines here, belt connected to generators and the current is transmitted over a pole line nearly three miles long to the central station.

An auxiliary to the water power development consists of two hydraulic rams pumping water from one of the Tracy Brook reservoirs to a 60,000-gallon tank, 100 feet above the ground, for fire protection for the buildings.

There are in all about twenty-five motors installed in the various buildings. The electric current actuates these motors, which are used to drive or operate numerous machines and labor-saving devices.

An entire load of hay is lifted from the wagon and stored in the mow by a ten horse power motor. A root-cutting machine is operated by a two horse power motor mounted on the ceiling above

Plate 21



Cascade on Indian Creek, Warren Co., N. Y.

Typical example of undeveloped water power.

it. A one and one-half horse power motor drives a vacuum pump which operates the milking machines. Five machines are used, each of which will milk two cows simultaneously. A one and one-half horse power motor runs the cream separator, and a three horse power motor drives the big churn, and motors are used for driving the water pumps as well as the brine circulation pumps in the ice-making plant. A grist mill driven by electric motor is part of the farm equipment, and the sausage-chopping and mixing machines are driven by a four horse power motor. Roots for the sheep are cut by a machine driven by motors of one and a half and two horse power, and food for the fish is prepared by a grinding machine driven by a two horse power motor. Woodworking machines and machine tools are driven by motors in the carpenter and machine shops.

In addition to the uses already mentioned, the electric power is also used to pump water, shear the sheep, clip the horses, wash, dry and iron the clothes, heat the house, cook the food, freeze the ice cream, cool the house in the summer, curl the ladies' hair and play the piano.

DEVELOPING A SMALL WATER POWER.

The prime requisite to the creation of a water power is the existence of falling or flowing water. The amount of power which may be available varies first, with the amount of water flowing, and second, with the amount of fall. It requires about one cubic foot of water per second, falling through a height of ten feet to make available one theoretical horsepower. The fall may be either naturally concentrated at one point in a cascade or it may be artificially concentrated, for the purpose of development, by combining the fall of several cascades or a series of rapids. This may be accomplished by either of two methods; first, by building a dam at the downstream end of the rapids to impound the water so that the entire fall is concentrated at the dam, or second, by building a dam at the upstream end of the rapids and conducting the water through a closed pipe to the lower end of the rapids where the resulting water pressure will be exactly the same as in the first instance. A variation of the latter method consists of diverting the water from the natural channel at the head of the rapids and carrying it in a canal, on a slight down grade, along the side of a hill to a suitable point at which the water is turned into penstocks, which run directly down the slope to the stream, where the power development may be made. The latter method, involving the construction of a canal, is open to the objection that considerable trouble is usually experienced from the accumulation of ice in the winter time. The first two methods described are the most common.

The amount of water which flows in a stream in New York State, whether large or small, is subject to remarkable variation. Only one who has observed very carefully and continuously by actual measurement the extremes of fluctuation to which a flowing stream is subject, is in a position fully to appreciate this. Some of the larger rivers of New York State are subject to such fluctuations of flow that the amount of water discharged during flood periods is several hundred times as much as the amount that flows in the extreme dry period. Also, in many instances from one-half to three-fourths of the total runoff of the stream during the year occurs during a period of a few weeks in the spring months when the accumulated snow and ice is melted and runs off in conjunction with the warm spring rains. Unfortunately, reliable data relating to the fluctuations of small streams in this State are very meager. It is, however, a matter of record that the smaller streams for which records are available, are subject to greater fluctuations per unit of tributary watershed area than are the larger streams. It seems logical, therefore, to assume that the very small creeks and brooks are subject to fluctuations relatively greater than those recorded for streams of only relatively small size. This fact must be borne in mind by any one who proposes to develop the power on a stream, for if it is overlooked the project is not so assured of success. For most purposes power is required in about the same amount for all seasons of the year, while, as previously stated, the streams run off most of their waters in the spring. Therefore, in developing the power of any particular stream, if the power is required to be fairly constant at all seasons of the year, as is usually the case, there are two considerations which must not be overlooked:

First: Will the minimum flow of the stream — that is, the flow which occurs in the driest season of a dry year — be sufficient to furnish the amount of power required?

Second: If the minimum flow is not sufficient, what means are available for storing the surplus water from the wet season until the dry season?

The subject of equalizing stream flow throughout the year by means of storage reservoirs has been so thoroughly discussed in the reports of the Commission that further discussion in this connection does not seem warranted.

Taking a general average throughout the State of New York, large streams may be depended upon to produce from one-twentieth to one-quarter cubic foot of water per second per square mile of tributary drainage area, during the driest period. Streams having only one or two square miles of drainage frequently dry up entirely in the dry seasons. If a power development is proposed of such a character that some considerable sacrifice of power might be made in the dry seasons with no serious loss, most small streams may be developed to provide for as much as one-quarter to one-half of a cubic foot per second per square mile. On the other hand, it is often found practicable to provide a small auxiliary power plant, such as gasoline or kerosene, to fall back upon in dry weather or to supply extra power occasionally, in which case the water power development need not be limited to the minimum flow of the stream.

The power of falling water may be applied to practical purposes in several ways. One of the simplest ways, should it be desired to use the power of the stream to pump water, is by means of what is known as a hydraulic ram. This is a device which operates on the principle of the impact due to the sudden stoppage of flow of a column of water. By means of this device, or engine, water falling through a very small height may be used to raise a portion of the same or a comparatively small amount of other water to an elevation considerably higher than the supply. The mechanical efficiency of the hydraulic ram is comparatively high under certain conditions, but generally is very low, useful work which manufacturers claim may be realized varying from 38 per cent to 80 per cent. The minimum fall under which a ram will effectively elevate water is about two feet. This fall will elevate about one-thirteenth of the supply to a height of twenty feet. Under the most favorable conditions and a fair amount of fall, a ram may elevate water as high as 120 feet. The proportion of water which may be elevated varies from one-twentieth to two-sevenths of the total supplied and accordingly the proportion of water which must be wasted at the impetus valve of the ram varies from five-sevenths to nineteen-twentieths. These proportions both depend upon the ratio of the amount of supply to the amount to be elevated, that is, a small proportion may be elevated to a considerable height and vice versa. In cases where a small brook of suitable quality is available for domestic water suppy, it is often entirely practicable to install a hydraulic ram which will pump a sufficient proportion of the amount of supply to furnish a household with all the water necessary for ordinary domestic purposes, in spite of the fact that the brook may be on a lower level than the house. Owing to the fact that a hydraulic ram may be applied only to the purposes of elevating water, it is not generally considered as a means of developing water power, although in the broadest sense it does consist of such a development.

On the other hand, the purposes for which power is usually required are not only for the elevation of water for a water supply, but for many other and varied requirements. In such cases the power must be developed in such manner that it may be utilized to operate machinery near the site of the development, or transmitted for some distance, and there used to operate machinery or for lighting purposes. To develop water power in this manner requires some kind of a water wheel.

There are several types of water wheels, the principal ones being known as "undershot," "overshot," "breastwheel," "turbine" and "impulse." The overshot wheel is a type familiar to most readers, being usually of home manufacture. It consists usually of a wooden wheel with water compartments arranged at regular intervals around the periphery. The water is fed into the wheel at the top, just off the center. It flows into the compartment at the top and the weight being exerted on one side of the supporting axle causes the wheel to revolve, the water spilling out when the compartment or water pocket reaches the bottom. This type of wheel depends entirely for its power upon the weight of the water which causes the wheel to revolve.

The undershot wheel is very similar in construction to the overshot type but depends more for its power on the velocity of the flowing water which strikes the blades or buckets on the under side of the wheel.

The breastwheel is also similar in construction but is in reality an improvement upon the overshot and undershot types. It depends for its power on a combination of the action of gravity and the impulse of the water striking the blades or buckets. The water is fed into the wheel a little below the height of the axle and usually enters with considerable velocity, a part of which is transformed into useful work by the wheel.

The turbine is a type of wheel which is very extensively used. It is usually constructed of metal and consists primarily of a series of curved vanes or runners whose arrangement is similar to a screw. The action of the water flowing through these curved vanes causes the vanes and shaft to revolve, the vanes being solidly connected to the shaft, which may be either horizontal or vertical.

The fundamental working principle of an impulse water wheel is the turning into useful work of the impulse due to the velocity of a jet of water issuing from a contracted orifice. This is accomplished usually by conveying the water from the dam or other source of supply to the water wheel in a pipe of comparatively large size and then gradually reducing the size of the pipe immediately in front of the wheel to a comparatively small size by means of a reducer section, which is fitted with a nozzle the opening of which may or may not be regulated in size. This contraction of the stream of flowing water causes a spouting of the water under pressure and the water issues in a jet with very high velocity. The jet thus issuing from the nozzle strikes the cups of the impulse wheel which are arranged at regular intervals around the circumference of a metallic disc which is centered on an axle. The cups transfer the velocity of the jet to the wheel, and the water drops from them with very little velocity left in it.

In general the turbine type of wheel is best adapted to low heads or falls and the use of comparatively large volumes of water, and the impulse wheel is best adapted to the use of a comparatively high head or fall, and a comparatively small amount of water. There are certain intermediate conditions for which the manufacturers of each type claim their wheel is best suited and in such instances a study of local conditions is always necessary to determine which type of wheel is best adapted.

The development of a water power by means of any kind of a water wheel results in the conversion of the energy of the falling water into mechanical power which is exerted in a more or less rapidly revolving shaft. In order to apply this power of the revolving shaft to some useful purpose, there are several methods which may be used. The shaft may be directly connected to the shaft of an electric generator or dynamo to generate electric current, or it may be directly connected to a machine which it is desired to operate, provided the machine or dynamo is required to operate at the same speed as that of the wheel shaft. This is frequently not the case, so that under ordinary conditions the shaft of the wheel is fitted with a pulley, which in turn is connected by belt to another pulley on the machine which is to be driven.

By using pulleys of different diameters on the shaft of the water wheel and the shaft of the machinery to be driven, the speed of the machine may be several times more or less than the speed of the water wheel. For instance, if the water wheel revolves 200 revolutions per minute and it is desired to operate a machine, connected by belt, at a speed of 1,000 revolutions per minute, a pulley of comparatively small size, say four inches in diameter, is placed on the shaft to be driven, and a pulley of five times the diameter, or twenty inches, is placed on the shaft of the water wheel. This causes the shaft of the machine to revolve at a speed five times as great as the water wheel. If the speed of the water wheel is greater than that required for the machinery to be operated, then the reverse operation is followed out, placing a small pulley on the shaft of the water wheel and a larger one on the shaft of the machinery to be driven. If the speed of the water wheel is to be magnified more than about six times, it usually requires the installation of a countershaft and another series of pulleys in order to avoid the use of very large and very small pulleys. A pulley which has a very small diameter does not operate satisfactorily without considerable loss of power and a very large pulley is objectionable on account of the space which it requires.

When the water power is once developed it may be applied to practical use either near the place of development or at a considerable distance. If it is to be used for power only, and not for lighting, and can be used where it is developed, there is no need of converting it into electricity. But if it is to be used for lighting, or for power to be applied at a considerable distance from the water power site, then it becomes necessary to convert the power into electricity, in which form it may be most conveniently transmitted from one place to another. This requires an electric generator or dynamo, to be driven by the water wheel, and a transmission line, preferably of copper wire, to carry the current where it is to be used. In order to reconvert the current into power at the end of the transmission line, where the power is to be used, it is necessary to run the current into an electric motor, the shaft of which is made to revolve by the action of the electric current. This motor may then be connected directly or by belt, gears or chain drive, to the machine to be driven.

It should be borne in mind that in each of these steps of changing from water power to electric current, in transmitting the current over the wires, in reconverting it into power, and in transferring this power from a motor to a power operated machine, there is a mechanical loss of energy. These losses vary considerably in different instances. Assuming for illustration, that a water power, whose theoretical power is 10 horse power, is required to drive a power machine at a distance, the efficiencies and losses will be somewhat as follows:

Water wheel,	efficiency 80%,	Loss 20%,	generates 8.0 horsepower.
Connections,	efficiency 95%,	Loss 5%,	transfers 7.6 horsepower.
Dynamo,	efficiency 90%,	Loss 10%,	generates 6.8 horsepower.
Transmission,	efficiency 90%,	Loss 10%,	transmits 6.2 horsepower.
Motor,	efficiency 90%,	Loss 10%,	develops 5.5 horsepower.
Connections,	efficiency 95%,	Loss 5%,	delivers 5.0 horsepower.

Therefore, only five horsepower would be actually delivered to the machine to be driven. This amounts to only half of the theoretical power of the falling water, which is actually realized in useful work of the machine being driven. If the power from the water wheel is to be applied directly without generating electricity a much higher efficiency will be realized.

APPENDICES.

A. DECISIONS OF THE COMMISSION ON WATER SUPPLY APPLICATIONS.

B. LAWS RELATING TO THE COMMISSION.

C. RULES AND REGULATIONS GOVERNING WATER SUPPLY APPLICATIONS.

D. DRAFT OF BILL FOR GENERAL WATER STORAGE LAW.

E. REPORT ON CO-OPERATIVE RAINFALL AND STREAM-GAGING.

F. FINANCIAL STATEMENTS.

APPENDIX A.

DECISIONS OF THE COMMISSION ON WATER SUPPLY APPLICATIONS.

APPENDIX A.

DECISIONS OF THE COMMISSION ON WATER SUPPLY APPLICATIONS

The following table contains a list of the applications filed with this Commission since its creation, together with the disposition made of each case:

No.	Applicant.	Date of Filing.	Disposition.
1.	City of New York	Nov. 3, 1905.	Approved May 14, 1906.
2.	City of Kingston	Nov. 8, 1905.	Discontinued.
3.	City of Oneida	Dec. 2, 1905.	Approved Mar. 16, 1906.
4.	Village of Lyons Falls	Dec. 26, 1905.	Approved Mar. 28, 1906.
5.	Village of Constableville	Dec. 30, 1905.	Approved Apr. 19, 1906.
6.	City of Watervliet	Jan. 25, 1906.	Dismissed Sep. 25, 1906.
7.	Village of Millbrook	Feb. 21, 1906.	Withdrawn Mar. 5, 1906.
8.	Village of White Plains	Apr. 20, 1906.	Approved June 15, 1906.
9.	City of Lockport	May 24, 1906.	Approved July 13, 1906.
10.	Village of Malone	June 28, 1906.	Approved Jan. 18, 1907
11.	Village of Holland Patent	Aug. 25, 1906.	Approved Sep. 25, 1906.
12.	Village of Brewster	Oct. 12, 1906.	Approved Feb. 21, 1907.
13.	Village of Bergen	Oct. 18, 1906.	Approved Nov. 8, 1906.
14.	City of Gloversville	Nov. 27, 1906.	Approved Jan. 18, 1907.
15.	Village of Carthage	Dec. 13, 1906.	Approved Mar. 14, 1907.
16.	Hannacroix Water Co	Dec. 22, 1906.	Approved Oct. 17, 1907.
17.	City of Plattsburg	Jan. 19, 1907.	Approved Feb. 27, 1907.
18.	Village of Pleasantville	Feb. 9, 1907.	Approved Aug. 6, 1907.
19.	Village of Seneca Falls	Feb. 21, 1907.	Approved Oct. 16, 1907.
20.	Village of Waterville	Mar. 6, 1907.	Approved May 9, 1907.
21.	Village of Old Forge	Mar. 13, 1907.	Approved May 9, 1907.
22.	Village of Ossining	Mar. 13, 1907.	Approved Nov. 26, 1907.
23.	Village of Peekskill	Mar. 15, 1907.	Discontinued.
24.	Urban Water Supply Co	May 22, 1907.	Approved July 16, 1907.
25.	Village of East Aurora	June 13, 1907.	Approved July 18, 1907.
26.	Martinsburg Water District	July 2, 1907.	Approved July 15, 1907.
27.	City of New York — Modification of Catskill Aqueduct line	July 12, 1907.	Approved Oct. 15, 1907.
28.	City of New York — Schoharie watershed	July 12, 1907.	Discontinued.
29.	City of Rome	July 20, 1907.	Approved Aug. 15, 1907.
30.	Tannersville Water Co	Aug. 23, 1907.	Approved Dec. 21, 1907.
31.	Great South Bay Water Co	Dec. 14, 1907.	Approved Jan. 21, 1908.

No.	Applicant.	Date of Filing.	Disposition.
32.	City of Gloversville (second application)	Jan. 16, 1908.	Approved Feb. 18, 1908.
33.	Village of McGrawville	Jan. 20, 1908.	Approved Mar. 11, 1908.
34.	Village of Malone	Feb. 12, 1908.	Discontinued.
35.	Village of Bainbridge	Feb. 20, 1908.	Discontinued.
36.	Staatsburg Water Co	Mar. 6, 1908.	Approved Apr. 10, 1908.
37.	Village of Briarcliff Manor	Apr. 18, 1908.	Discontinued.
38.	Palenville Water District	Apr. 27, 1908.	Petition not completed.
39.	Harmon Water Co	July 16, 1908.	Withdrawn Sep. 16, 1908.
40.	City of New York — Suffolk county sources	July 29, 1908.	Pending.
41.	Village of East Syracuse	July 30, 1908.	Approved Aug. 14, 1908.
42.	Edmeston Water Co	Aug. 14, 1908.	Approved Sep. 16, 1908.
43.	Village of Marcellus	Aug. 24, 1908.	Approved Sep. 30, 1908.
44.	Village of Shortsville	Oct. 5, 1908.	Approved Feb. 6, 1909.
45.	Village of Clifton Springs	Oct. 5, 1908.	Approved Oct. 14, 1908.
46.	Village of Webster	Nov. 23, 1908.	Approved Dec. 12, 1908.
47.	Syracuse Suburban Water Co	Dec. 1, 1908.	Approved Apr. 9, 1909.
48.	Village of White Plains (second application)	Dec. 30, 1908.	Approved Nov. 30, 1909.
49.	City of Glens Falls	Mar. 6, 1909.	Approved Apr. 21, 1909.
50.	City of New York — Nassau county sources	Mar. 12, 1909.	Approved May 15, 1909.
51.	Village of Bainbridge (second application)	Mar. 16, 1909.	Approved Aug. 18, 1909.
52.	Fultonville Water Co	Mar. 17, 1909.	Combined with No. 57.
53.	Village of West Carthage	Apr. 7, 1909.	Approved Apr. 22, 1909.
54.	Rensselaer Water Co	Apr. 12, 1909.	Approved Apr. 21, 1909.
55.	City of Niagara Falls	Apr. 20, 1909.	Approved July 14, 1909.
56.	Village of Webster (amended application)	May 5, 1909.	Approved June 15, 1909.
57.	Village of Canajoharie	June 1, 1909.	Approved Mar. 10, 1910.
58.	Village of Croghan	June 17, 1909.	Approved Sep. 22, 1909.
59.	Village of Mechanicville	June 22, 1909.	Approved July 13, 1909.
60.	Central Bridge Water Co	July 2, 1909.	Approved July 29, 1909.
61.	Whitney's Point Water Co	July 8, 1909.	Approved July 30, 1909.
62.	Water District of Town of Petersburg	July 15, 1909.	Approved Oct. 14, 1909.
63.	Village of Livonia	July 16, 1909.	Approved Oct. 21, 1909.
64.	Village of Mt. Morris	Aug. 2, 1909.	Discontinued.
65.	Village of Painted Post	Aug. 18, 1909.	Approved Sep. 3, 1909.
66.	Village of Farmingdale	Sept. 22, 1909.	Discontinued.
67.	City of New York — Modification of Catskill Aqueduct	Dec. 16, 1909.	Approved Oct. 7, 1910.
68.	Village of Barker	Jan. 11, 1910.	Discontinued.
69.	Jamaica Water Supply Co	Jan. 13, 1910.	Approved Feb. 15, 1910.
70.	Village of Pike	Feb. 3, 1910.	Approved Mar. 10, 1910.
71.	Village of Keeseville	Mar. 4, 1910.	Approved May 25, 1910.

No.	Applicant.	Date of Filing.	Disposition.
72.	Otisville Water District	Apr. 4, 1910.	Approved Nov. 30, 1910.
73.	Village of Spencerport	Mar. 23, 1910.	Approved May 10, 1910.
74.	City of Plattsburg	Mar. 24, 1910.	Denied May 20, 1910.
75.	Village of Croton-on-Hudson	Apr. 6, 1910.	Approved Aug. 24, 1910.
76.	Harrison Water District No. 1	Apr. 18, 1910.	Approved May 20, 1910.
77.	Greenwich Union Water Works Co.	Apr. 29, 1910.	Approved May 11, 1910.
78.	Village of Black River	May 3, 1910.	Approved May 20, 1910.
79.	Belfast Water District	May 26, 1910.	Approved July 7, 1910.
80.	Village of Moravia	July 6, 1910.	Approved Aug. 24, 1910.
81.	Village of Canajoharie	July 13, 1910.	Approved Aug. 10, 1910.
82.	Village of Youngstown	July 20, 1910.	Approved Aug. 24, 1910.
83.	City of Hornell	Aug. 4, 1910.	Approved Aug. 24, 1910.
84.	Village of Silver Springs	Aug. 12, 1910.	Approved Nov. 3, 1910.
85.	City of Ithaca	Aug. 22, 1910.	Approved Oct. 7, 1910.
86.	Roslyn Water District	Aug. 17, 1910.	Approved Oct. 25, 1910.
87.	Village of Cherry Creek	Sept. 6, 1910.	Approved Oct. 7, 1910.
88.	Andes Water Co	Sept. 12, 1910.	Approved Oct. 7, 1910.
89.	Village of Oriskany Falls	Oct. 11, 1910.	Approved Nov. 3, 1910.
90.	Summerville Water District	Oct. 20, 1910.	Withdrawn Oct. 28, 1910.
91.	John A. Drew	Oct. 28, 1910.	Approved Dec. 29, 1910.
92.	Village of Angola	Dec. 7, 1910.	Approved Dec. 29, 1910.

APPLICATION NO. 67.

NEW YORK CITY. Modification of Catskill aqueduct.

Petition filed December 16, 1909.

Hearings held January 12, February 10, February 28, March 23, April 28, May 24, June 29 and July 13 and 14, 1910.

The petition asked for approval of plan to change the manner of delivering the water from the Catskill mountain sources to the several boroughs of the city. The plan provides for the distribution of the entire supply of water by means of a deep pressure tunnel from Hillview reservoir through the boroughs of the Bronx and Manhattan and extending to Brooklyn, supplemented by pipe lines to the boroughs of Queens and Richmond. It is proposed to construct a reservoir of four or five hundred million gallons capacity for local distribution in Richmond.

The Commission approved the application October 26, 1910.

Decision filed October 26, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter of the Application
of
THE CITY OF NEW YORK to the STATE WATER SUPPLY COMMISSION for the approval of the report of the Board of Water Supply of the city of New York to the Board of Estimate and Apportionment of the city of New York, dated November 15, 1909, recommending modification of the map, plan and profile, dated October 9, 1905, approved by said Commission May 14, 1906, which modification is dated November 15, 1909, and is entitled "Board of Water Supply of the City of New York. Map and profile showing manner of delivering the water to the several Boroughs."

Decision.

On December 16, 1909, the petition in the aforesaid matter was duly filed with this Commission. The Commission caused public notice to be given as provided by law that on the 12th day of January, 1910, the Commission would conduct a public hearing thereon at the office of the Board of Water Supply of the city of New York. Pursuant to such notice duly given, the Commission met at the office of the Board of Water Supply, 299 Broadway, New York city, for the purpose of such a hearing, noted the appearances, and received in evidence such documentary evidence as the applicant offered.

The Board of Estimate and Apportionment of the city of New York, by its resolution bearing date January 7, 1910, requested this Commission "to defer final action on any projected extensions or modifications of New York's water supply system." In compliance with this request and upon motion of the corporation counsel for the petitioner, the proceedings were adjourned from time to time and until July 13, 1910, prior to which last named date, and on July 1, 1910, the said Board of Estimate and Apportionment of the city of New York rescinded its resolution of January 7, 1910, aforesaid. Said Board did by resolution of the same date approve and adopt the report, map, plan and profile of the Board of Water Supply dated November 15, 1909, and declared the same to be the final map, plan or plans approved and adopted by the Board of Estimate and Apportionment pursuant to the provisions of chapter 724 of the Laws of 1905 as amended.

The petition in substance prays for the approval by this Commission of the plan of the Board of Water Supply of the city of New York, duly submitted to and approved and adopted by the Board of Estimate and Apportionment of the city of New York, for the distribution of the water supply to be secured from the Catskill mountain sources to the various boroughs of the city of New York. The general plan for the additional water supply for New York city, approved by this Commission on the 14th day of May, 1906, provided for the construction of storage reservoirs in the Catskill mountains and an aqueduct running from such reservoirs to New York city. It was brought out at that time that the plans for distribution of the water to the various boroughs were only tentative and that the same would be covered by a subsequent application to this Commission. The present petition, therefore, relates only to an extension or modification of the original plan for distributing water to various boroughs of New York city. The proposed plan specifically contemplates the distribution by means of a deep pressure tunnel from Hillview reservoir through the boroughs of the Bronx and Manhattan and extending to Brooklyn, supplemented by pipe lines to the boroughs of Queens and Richmond, of the entire supply of water that may be obtained from the Catskill sources. In the borough of Richmond it is proposed to construct a reservoir of four hundred or five hundred million gallons capacity for local distribution purposes.

The evidence shows that exhaustive studies have been conducted by the engineers for the city to determine the most feasible and suitable method for the distribution of this Catskill mountain supply to the various city boroughs. The reports and data submitted to this Commission by the Board of Water Supply with the petition, together with the evidence given at the hearing, indicate clearly that the plan proposed, namely, the pressure tunnel project, is both feasible and economical. The information at hand and the evidence adduced at the hearings also clearly indicate that the proposed plan is thoroughly adequate to meet all reasonable needs of the city for a considerable period of time and will result in the least possible inconvenience to the public and do the least damage to property during its construction.

It is also shown that the increased pressure which will be available from the proposed tunnel in some of the districts to be served will result in a great saving to the city by obviating the necessity of pumping large amounts of water, which, under any plan contemplating comparatively small pipes, would have to be pumped in order to afford sufficient pressure for satisfactory domestic service and fire protection.

The Commission has made a careful study of the project proposed, and of the evidence submitted by the petitioner, and is of the opinion that the proposed plans are both wise and economical.

It is evident that some proper method for the distribution of the proposed Catskill mountain water supply to the various boroughs of New York city is absolutely essential to the successful completion and operation of that proposed system, and it having been clearly shown that the proposed plan is both feasible and economical, this Commission, therefore, finds:

That the plans of the petitioner are justified by public necessity.

The present petition does not contemplate any action on the part of the city of New York that will affect in any manner whatever any other municipality or civil division of the State or the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

The plan of the city to pay for any and all damages that may result from the execution of said plans and the acquiring of any lands that may be necessary therefor is to purchase the lands and with the money allowed it by the Board of Estimate and Apportionment to pay for such lands and for any and all damages, whether direct or indirect, that will result therefrom.

The Commission, therefore, finds and determines:

First: That the plans of the petitioner are justified by public necessity.

Second: That the plans of the petitioner are just and equitable to other municipalities and civil divisions of the State affected thereby, and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third: That the plans of the petitioner make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which may result from the execution of the plans of the petitioner or the acquisition of the lands therefor.

The State Water Supply Commission does, therefore, grant the petition and approve the application and plans of the petitioner.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same with all maps, plans, surveys and other documents and papers relating thereto filed in its office in the City of Albany this 20th day of October, 1910.

[L. S.]

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 68.

Barker (Incorporated Village), Town of Somerset, Niagara County.

Petition filed January 11, 1910.

Hearing held February 4, 1910.

Present source of supply, driven or dug wells. No public system. For fire protection there is one hand fire engine.

The petition asked for approval of plan to take water from Lake Ontario, a filtration gallery, 50 by 25 feet to be built on shore of lake and connected with a pump well. Plans provide for a triplex pump driven by a gasolene engine stationed near pumpwell and the water pumped to a standpipe within village limits, dimensions of which would be 14 feet in diameter by 90 feet high, with a capacity of 104,000 gallons. The distributing system consists of four, six, eight and ten-inch cast iron pipe and thirty double nozzle fire hydrants, 400 feet apart.

Estimated cost of proposed project, $24,000.

At a vote of the taxpayers held June 16th, the proposition to install the system was defeated and the application was withdrawn.

APPLICATION NO. 69.

JAMAICA WATER SUPPLY COMPANY (domestic corporation), Queensborough, Queens county.

Petition filed January 13, 1910.

Hearing held February 2, 1910.

The company is engaged in supplying water to Jamaica and also Richmond Hill, Hollis, Springfield, Jamaica South, Dunton, Morris Park, Floral Park and New Hyde Park (latter two in towns of Hempstead and North Hempstead).

Source of supply is from driven wells pumped from two stations each with a capacity of five million gallons per twenty-four hours to standpipes and from there through supply pipes to the towns and villages. The district is a rapidly growing one and the supply has proved insufficient for both fire and domestic purposes.

The petition asked for approval of plan to drive thirty-six wells at Elmont, town of Hempstead on land owned by the company, covering about 15.32 acres.

Analyses showed the water to be of good quality and suitable for all domestic purposes including drinking.

The Commission approved the application February 15, 1910.

Decision filed February 15, 1910.

BEFORE THE STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the JAMAICA WATER SUPPLY COMPANY.
} *Decision.*

Application filed January 12, 1910.

Hearing at Jamaica, N. Y., February 2, 1910.

Decision February 15, 1910.

The Jamaica Water Supply Company is a domestic corporation organized under the laws of the State of New York, having its principal office at Jamaica, county of Queens, State of New York. It is engaged in furnishing water, by pumping, for domestic use and fire protection in Jamaica, which is now part of the greater city of New York, and to Richmond Hill, Hollis, Springfield, Jamaica South, Dunton, Morris Park, Floral Park and New Hyde Park (which latter two are located in the towns of Hempstead and North Hempstead). The evidence shows that this is a rapidly growing district. The Jamaica Water Supply Company at present has two pumping stations with a capacity of about five million gallons each per twenty-four hours. The evidence also shows that this supply has proved insufficient both for domestic purposes and fire protection in the locality served, various complaints having been made to the company by its patrons. The company proposes to acquire about 15.32 acres of land situated on the Hempstead and Jamaica Turnpike road about 3,600 feet east of the New York city line. The company has an option on this property and has sunk a test well to the depth of ninety feet which shows an ample supply of pure and wholesome water. It is financially responsible and able to pay any damages that may be awarded. The plans submitted indicate that the company purposes to sink about thirty-six wells on this property which will produce between four and five million gallons per day. This quantity is believed to be sufficient to meet the increasing demands made upon the company. It is proposed to connect this new supply by conduit to their present system. The analysis of the water shows it is of good quality and suitable for all domestic purposes, including drinking. No one appeared in opposition at the hearing and it is evident no other municipality or civil division of the State will be affected by the proposed plans of the applicant.

The State Water Supply Commission therefore determines:

First. That the plans proposed by the Jamaica Water Supply Company are justified by public necessity.

Second. That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third. That the said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The State Water Supply Commission does hereby approve the maps of the lands to be acquired by the Jamaica Water Supply Company for a new or additional source of water supply and the plans or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of said lands and the execution of said plans.

[L. S.] IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same with all plans, maps, surveys and other papers relating thereto filed in its office in the city of Albany, this 15th day of February, 1910.

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
Commissioners.

APPLICATION NO. 70.

PIKE. (Incorporated village.) Town of Pike, Wyoming county.

Petition filed February 3, 1910.

Hearing held February 25, 1910.

Village has no public system and takes water from private wells.

Petition asked for approval of plan to take water from Lyon and Miller springs, gauging about 58,100 gallons daily, to serve a population of 450. Reservoir situated 100 feet below Lyon spring, with a capacity of 168,000 gallons.

Analyses showed a very moderate amount of organic matter, and bacteria of the B. Coli type were not present.

Total estimated cost of the proposed project, $20,500.

The Commission approved the application March 10, 1910.

Decision filed March 11, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the VILLAGE OF PIKE for a new and additional source of water supply.

Decision.

Present: Henry H. Persons, President; Charles Davis and Milo M. Acker, Commissioners.

OPINION.

The village of Pike, by its president and its board of trustees, on the 3d day of February, 1910, filed with this Commission a verified application asking for the approval of its maps and plans for a new source of water supply. The application was accompanied by maps, plans and a report of Frederick K. Wing, a civil engineer, showing the plans proposed and the estimated cost of the installation of such a municipal water plant.

The matter came on for hearing on the 25th day of February, 1910, pursuant to a notice duly given as provided by law and the rules of the Commission.

The village was represented by Mr. H. E. Harding, its counsel, and by Thomas Culver, its president, and Edward Goepp, one of its trustees.

No objectors appeared on the day of the hearing except Mr. S. J. Russell, who had previously filed objections, and Mr. D. A. Green, who had asked, by letter dated February 15, 1910, the Commission to consider a petition of taxpayers protesting against the granting of the application. No such petition, however, was filed.

The village of Pike has a population of 450 people and an assessed valuation of $150,975; a bonded indebtedness of only $250 and no public water supply whatever.

The water for domestic purposes is now derived from wells owned by individuals and located on private property as is common in all villages before the installation of public supplies. It has no adequate fire protection. It has, however, a hand fire engine and takes water for fire protection from a creek running through one side of the village. Whenever a fire occurs at a point 400 feet or more distant from the creek, there is no fire protection at all. Only about one-third of the village is protected by the hand fire engine and its equipment.

The village has voted, as provided by the village laws, for the raising of $15,000 to install a municipal water plant. This village is situate in the valley of the Wiscoy creek. It proposes to go to the west about 672 feet at an elevation of 126 feet above the village and utilize a spring known locally as Lyon spring. The plan presented is to completely protect this spring from all possible contamination and then construct a reservoir about 100 feet below the spring with a capacity of 168,000 gallons, which will of itself furnish 175 gallons per minute for each of four streams for four hours in case that amount of water is needed for fire protection. The spring and this reservoir will furnish ample water for domestic purposes of the village for the present and is so situated that it can be re-enforced by piping the waters from another spring known locally as the Miller spring situate about 2,000 feet nearly northwest of Lyon spring and at an elevation of 15 feet above it, if the future demands of the village of Pike should require it.

The plans of the village propose to run its pipes so as to furnish water for domestic purposes to practically all of the houses in the village and to establish fire hydrants so as to afford ample fire protection to the entire village. By utilizing the Lyon spring in the manner proposed, the plant can be installed within the limits of the money voted by the village for the purpose.

The water of the spring has been analyzed and although the analysis shows slight contamination, such contamination is evidently caused by surface water which ran into the spring at the time the sample for analysis was taken. By protecting the spring as proposed in the plan, it is feasible to shut out all possible contamination from surface water, dust, or otherwise.

The village of Pike is situate about six miles distant from any other incorporated village. The village proposes to purchase the land upon which Lyon spring is situate and any other lands necessary for the installation of its proposed municipal plant if it can agree with the owners of the property to be taken upon its value and if an agreement cannot be had, then to obtain such property by condemnation proceedings and in either event, to pay for the property out of the money voted by the village for the installation of this water system.

The village also agrees in its application that it will stipulate in case a claim is made for damages, that the claimant shall not be limited in the reception of evidence to the rules reglating the proof of direct damages. There are no other municipalities or civil divisions of the State that will be affected by the installation of the proposed municipal water system.

It is evident that a municipal water plant owned by this village and which will supply an abundance of pure and wholesome water for domestic purposes and provide ample fire protection to the village would contribute to the comfort of the community, protect its property from destruction by fire and thereby make its property more valuable and the community a more desirable place of residence.

DECISION.

The State Water Supply Commission, therefore, determines:

First: That the plans proposed by the village of Pike are justified by public necessity.

Second: That such plans are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to the present and future necessities for sources of water supply.

Third: That the plans proposed by the village of Pike make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of such plans.

The State Water Supply Commission does hereby approve the map and plans of the village of Pike for a new and additional source of water supply and the profiles thereof showing sites and areas of the proposed reservoir and other works, the profile of the pipe lines and the flow lines of the water when impounded, plans, surveys and official reports relating to the same and the plan or scheme to determine and provide for the payment of a proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of said lands and the execution of said plans.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION has caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same, with all plans, maps, surveys and other papers relating thereto filed in its office in the city of Albany, this 10th day of March, 1910.

[L. S.]

HENRY H. PERSONS,
President.

MILO M. ACKER,
JOHN A. SLEICHER,
CHARLES DAVIS,
State Water Supply Commission.

APPLICATION NO. 71.

KEESEVILLE. (Incorporated village.) Towns of Ausable and Chesterfield, Counties of Clinton and Essex.

Petition filed March 4, 1910.

Hearing held March 25, 1910.

Village had been taking its supply from Ausable river but water had become polluted.

Petition asked for approval of plan to construct two artesian wells, 475 feet deep, giving a supply of ninety gallons a minute, to serve a population of 2200. The plans also provide for a pumping plant at the wells on the bank of the river, equipped with a water wheel. Also an auxiliary steam plant to be used during dry months. The reservoir which is to be located 300 feet above the pumping station and connected with it through the pipes of the distribution system, will be excavated out of solid granite, lined with concrete and have a capacity of 500,000 gallons.

Analysis showed the water to be of excellent quality.

Total estimated cost of proposed project $20,000.

The Commission approved the plans of the applicant March 25, 1910.

Decision filed May 4, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter

of

The Application of the VILLAGE OF KEESEVILLE for approval of its maps, plans and profiles for a new source of water supply.

Decision.

Application filed: March 4, 1910.

Hearing at Village of Keeseville: March 25, 1910.

Decision: March 25th, 1910.

The village of Keeseville is situate partly in the town of Ausable, Clinton county, and partly in the town of Chesterfield, Essex county, and on the Ausable river, which passes through the village, forming the boundary line of the two counties. The village is one of the municipal corporations of the State. For the past twenty years the number of its inhabitants has not varied to any particular extent from 2200. The present total assessed valuation of all the property, real and personal, in the village is approximately $600,000, and the only indebtedness is the sum of $10,000, of which $6,000 is a balance due for the present water supply, and $4,000 for street improvements. In or about the year 1883, the village constructed a system of municipal waterworks, comprising a pumping station on the bank of the river within the village limits, six or seven miles of distributing piping with the customary gates and suitable fire hydrants well located; so far as appears the system has met its intended purpose and is now in good physical condition. The supply of water is taken directly from the river and without either storage or filtration of any kind is pumped directly to the consumers. At the time of the construction of the plant, the river afforded a suitable quality of water for all its purposes. With the growth of population and manufacturing along its course, its water became gradually polluted until at the present time its water is unfit for domestic use, and while the quantity of water is abundant and the fire protection afforded is satisfactory, the use of this water for potable or other domestic purposes has been almost entirely abandoned. The inhabitants now obtain a temporary supply from springs and wells. It is obvious that this condition of the water supply in so large a village as Keeseville should excite the apprehension of its inhabitants as well as that of those charged with the duty of furnishing to its people an abundant and pure supply of water, and in April, 1909, the qualified electors of the village by an affirmative vote of 123 to 65 opposed adopted a proposition to raise the sum of $20,000 for the purpose of obtaining a supply of pure water. Thereafter the village authorities caused to be made careful investigation of the surrounding country and its possibilities as to sources of water supply and it was found that there were only two natural bodies of water commercially accessible, one Augur lake, and the other Butternut pond. The altitude and intervening topography is such that either or both could be conveyed by a gravity conduit to the elevation of the present pumping station on the bank of the river, from which it would be necessary to pump the water to a standpipe or reservoir of sufficient altitude to furnish adequate fire pressure. There were objections, however, to the use of these waters both from sanitary and economical standpoints, and after mature consideration the municipal authorities determined to obtain the supply from artesian wells located near the bank of the river and within the village limits and upon property now owned by the municipality. One of the wells having an eight-inch bore has already been sunk about 500 feet and affords a flow of 90 gallons per minute. While this is possible with careful and economic use sufficient for the present needs of the village, it was wisely determined to be too little to meet the probable necessities of the village and the construction of another similar well has been commenced.

The Ausable river furnishes for only about eight months in the year sufficient water to furnish power for running the present pumps, and it is proposed to install a steam or gasolene engine to tide over the dry period on the river. In order to provide sufficient quantity of water for the required fire protection and to obtain the full benefit of reduced fire insurance rates, it is proposed to hold in storage under pressure about one-half million gallons. This is to be provided for by a reservoir blasted out of solid granite and lined with concrete to avoid leakage, located on what is locally known as Prospect Hill, about one mile outside of the corporation and at an elevation above the pumping station of about 300 feet and about 200 feet above the average level of the residential section. The reservoir is to be connected with the pumping station through the pipes of the distribution system and an extension of the same, so that it will have the effect of maintaining a constant pressure ample for domestic and fire protection purposes.

The only property the village will be required to purchase is a plot in the town of Chesterfield upon which to construct the reservoir and the necessary right of way for the pipe line to the distributing system.

An analysis of the water has been made from which it appears that the water from the wells is entirely satisfactory and suitable for a domestic supply.

The water being obtained from driven wells and the underground supply being undoubtedly abundant, there will probably be no question raised against the plans on the ground that the taking of the proposed water will affect other municipalities and civil divisions of the State.

No objections to the plans of the applicant were filed with the Commission by any person, municipality or civil divisions of the State.

The State Water Supply Commission having examined the maps and profiles of said application and heard the proofs and arguments submitted in support of the proposed project and due deliberation having been had thereon, determines:

(1) That the plans proposed by the Board of Water Commissioners of the village of Keeseville for a new or additional source of water supply for the village of Keeseville are justified by public necessity.

(2) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3) That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The said State Water Supply Commission does hereby approve the application of the Board of Water Commissioners of the village of Keeseville as presented.

In witness whereof, The State Water Supply Commission hath caused this decision to be made and signed and hath caused its [L. S.] official seal to be affixed and the same, with all plans, maps, surveys and other papers or records relating thereto, filed in its office in the city of Albany, New York, this 25th day of March, 1910.

HENRY H. PERSONS,
President.

CHARLES DAVIS,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 72.

Otisville. (Water district.) Town of Mount Hope, Orange county.

Petition filed April 4, 1910.

Hearings held April 27, May 31, July 6 and August 10, 1910.

Village has no public supply and depends on twenty-two private wells and cisterns.

Petition asked for approval of plan to take water from spring on property of Wheat and Savage with a watershed covering an area of twenty-three acres.

It is to be a gravity system with a reservoir covering 1⅔ acres, a depth of 16½ feet and having a capacity of 6,000,000 gallons. An eight-inch cast iron main will connect distributing system with reservoir. Population 389. Estimated cost, $20,000.

Analysis showed water to be of good quality and the number of bacteria per C. C. not high for spring water.

The Commission approved the plans of the applicant, November 30, 1910.

Decision filed November 30, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter

of

The Application of THE OTISVILLE WATER DISTRICT for the approval of its maps, plans and profiles for a new water supply.

Decision.

This is an application by a water district situate at Otisville, in the town of Mount Hope, Orange county, for the approval of its maps, plans and profiles for a water supply for the district and for authority to take and acquire the lands described in the petition for the purpose of its water works system.

The water district embraces practically all of the unincorporated village known as Otisville, which is a station of the main line of the Erie railroad in Orange county. The population of the district is from actual count 389; the assessed value of the real property within the district is $359,182.99, which amount includes $280,180 of assessed value of the Erie railroad. Included within the water district are 80 dwellings, 8 general stores with families living over 6 of them, 2 creamery buildings, 3 coal sheds, 1 feed store, 1 railroad station, 1 schoolhouse, 2 barber shops, 2 hotels, 3 churches and 48 other buildings used as barns and sheds, making a total of 151 buildings, of which 10 are brick.

That portion of the district, which is contiguous to the railroad station and to the stores, hotels and churches, is closely built up. At the present time there is no public water supply, nor any fire protection whatever.

The people of the district depend upon some 22 private wells and upon private cisterns for their water supply and have suffered seriously from a shortage of water during the dry months of the year.

A private water company, known as the Mount Hope Water Supply Company, organized to supply this locality with water for fire protection and domestic uses in 1907, purchased a proposed reservoir site some 4,000 feet from the center of the district and a right of way for a pipe line from the reservoir to the village. It also controls a system of springs near the reservoir site from which the supply of water was to be obtained, and it also owns water rights and easements for pipe lines over private property and in the public highways, with rights of access for purposes of construction and maintenance of pipe lines, but no construction work has yet been done.

The stockholders of this water company are all residents of the Otisville water district, and the company, with the written consent of these stockholders, has made an agreement to convey to the water district all its rights and property for a consideration of one dollar.

The plan of the water district contemplates the construction of an adequate gravity water supply system for the district utilizing the real property and rights of the private water company to be given to the district and to be owned and operated by the water district. The contemplated reservoir has an area of about one and two-thirds acres, an extreme depth of 16½ feet and a storage capacity of 6,000,000 gallons. The watershed above the reservoir has only twenty-three acres, but the supply of water from the springs appear to be more than would naturally flow over a shed of this size. Two of these springs have flowed continuously during the exceptionally dry weather of 1908 and 1909.

The elevation of the water in the reservoir will be about 150 feet above the center of the village and an eight-foot cast iron main will connect the distributing system in the village with the reservoir. The distributing system of cast iron pipes will be accessible to all the buildings and twenty fire hydrants are to be located so as to give fire protection to all the property in the district.

The water from the springs has been analyzed by competent authorities and proves wholesome and free from contamination. There are no buildings or sources of pollution within the watershed from which contamination could come. The water is of a good quality for domestic uses.

No other municipalities or civil divisions of the State are affected by the plans of the applicant, and the plans presented make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of the plans and the acquiring of the lands.

Approval of this application would follow quickly were it not for the objections that have been raised.

After notice had been given of this application, objections were filed by the Erie Railroad Company and several others, residents and owners of property in the district. These objections may be summarized as follows:

(1) There is no legally erected water district.

(2) The proposed water supply system for the district cannot be constructed for the sum of $20,000, the maximum amount stated in the petition to the Town Board, which established the district.

(3) The proposed plan will not provide sufficient supply of water.

Upon the hearing, the objectors made offers of testimony which it was claimed would show that the Otisville water district had not been established in conformity to the statute. (§§ 282 to 287, Town Law.)

It appeared, however, from the face of the petition, the map and plan annexed thereto, the filing in the offices of the town and county clerk, the publication of the notice of such filing and of the time and place of meeting of the town board to consider the petition, the determination of the town board thereon and the order establishing the district, and appointing the water commissioners, that all such proceedings were in conformity to the statute, and we hold that we are bound by the order of the town board, organizing the district, that this Commission has no jurisdiction to make any finding or determination relative thereto, where, upon the face of the proceedings, it appears that the statutory requirements had apparently been observed.

The maximum amount stated in the petition to the town board to be expended in the construction of the proposed system was $20,000. Upon the hearing there was testimony to show that the estimated cost of the work was at least 50 per cent more than that amount, as well as testimony to show that the work could be constructed for the sum of $20,000. As the statute relative to water districts (§ 287, Town Law) provides that the commissioners of the district shall advertise for proposals for the construction of the system and that no contract shall be made by which a greater amount shall be agreed to be paid than the maximum amount stated in the petition, this objection fails, here. There is still another check provided by the statute (§§ 287 and 288, Town Law) as to the amount of money to be expended by the water commissioners.

Upon the execution of the contract for the construction of the system it becomes the duty of the district commissioners to notify the town board of the town as to the amount of money needed and the town board only can raise this necessary amount, which cannot exceed the maximum amount stated in the original petition.

The objection that the proposed plan will not provide a sufficient supply of water is more serious. The watershed is about twenty-three acres in extent, a portion of it is steep sidehill covered with low underbrush, another portion is steep sidehill cleared of brush from which rain water will run off very rapidly, and about one-half of the shed is swampy, covered with underbrush and swamp weeds. The two principal springs, upon which dependence is placed, were tested during the present summer (1910), and were flowing only about 4,000 gallons per 24 hours; the water was clear and cool, indicating a flowing spring rather than drainage from surface water; the other springs probably dry up in the summer. It is apparent that the district will have to depend upon stored water for at least four months in each year and unless the consumption is kept as low as forty gallons per capita per day the supply will not be sufficient for the entire year.

Examinations made of the territory surrounding the water district have failed to furnish any better supply than the one proposed, the alternative of driven wells and a pumping system would entail a greater first cost and operating expense than the size of the district would warrant. In view of the fact that this water district is without fire protection, that the buildings are almost entirely of frame and closely built up, and a conflagration would cause great suffering and damage, that for domestic purposes the inhabitants rely entirely upon some twenty-two private wells and upon private cisterns, and that serious suffering has already been caused by a shortage in these supplies, that it is the command of the statute, creating this Commission, that it shall make a reasonable effort to meet the needs of the applicant, it follows that this application should be approved.

The Commission, however, recommends that meters should be installed upon every service tap, in order to keep the daily consumption of water down to forty gallons per capita, the estimated safe yield of the sources of supply.

The State Water Supply Commission, therefore, finds and determines:

(1) That the plans of the applicant for a new source of water supply are justified by public necessity.

(2) That the plans of the applicant are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3) That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves of the plans of the applicant for a new source of water supply.

IN WITNESS WHEREOF, THE STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same, with all maps, plans, surveys and other papers relating thereto, filed in its office in the city of Albany, this 30th day of November, 1910.

[L. S.]

HENRY H. PERSONS,
President.
MILO M. ACKER,
CHARLES DAVIS,
JOHN A. SLEICHER,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 73.

SPENCERPORT. (Incorporated village.) Town of Ogden, Monroe county.

Petition filed March 23, 1910.

Hearing held on April 14, 1910.

Village had no public system and depended on dug wells and cisterns for its supply of water.

Petition asked for approval of plan to drive a well, 12½ feet in diameter and 16 or 18 feet deep, in a gravel bank. This well when tested gave a supply of 82,000 gallons a day, to serve a population of 800. The pumping plant would consist of two pumps at the well, operated by gasolene engines, each 25 horse-power, connected with a single acting triplex pump, capable of pumping 350 to 400 gallons per minute. The water to be pumped to a standpipe, (cylindrical shell, 22 feet in diameter and 28 feet high, of riveted steel plate with hemispherical bottom and conical roof, supported on four columns) and situated 3,600 feet from well, and 70 feet above the main street, with a capacity of 100,000 gallons. Forty-six fire hydrants, double nozzle, 270 to 500 feet apart.

Analysis showed the water to be of fair quality although somewhat hard. Presence of B. Coli Communis not found in second sample.

Total estimated cost of project, $39,000.
The Commission approved the application May 10, 1910.
Decision filed May 13, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the VILLAGE OF SPENCERPORT for the approval of its maps, plans and profiles for a new source of water supply.
} *Decision.*

Application filed: March 23, 1910.
Hearing: April 14, 1910.
Decision: May 10, 1910.

This matter came on for a public hearing at the library, village building, in the village of Spencerport, N. Y., on the 14th day of April, 1910.

William R. Barrett, Edwin J. Nichols and George P. Helfrich, trustees of the village, appeared for the applicant.

No objections were filed to the petition and no one appeared in opposition.

The village of Spencerport is a municipal corporation situate in the town of Ogden, Monroe county, about twelve miles south of Lake Ontario and about eleven miles distant from the city of Rochester. In 1905, its population was 753; since then this number has considerably increased. New buildings have been erected and a general condition of prosperity exists. The assessed valuation of the property within the corporation as appears from the last assessment-roll, is $476,475. The total present indebtedness of $7,200 was incurred for the construction of a municipal building and the annual budget for all purposes is about $4,000.

The present water supply for domestic purposes is only such as is obtained from wells and cisterns upon private property. Those of the inhabitants who are without these, rely upon the generosity of their neighbors for a supply. The water in some of these wells has become contaminated and the use of them has been abandoned. For fire protection the authorities have relied upon some four or five cisterns, from eight to nine feet in diameter constructed below the surface of the streets; two of these are supplied by water from the roofs of adjacent buildings and the others by pumping from the Erie canal, which runs through the village. Property outside of the useful radius of these cisterns is without protection. Union street, the main thoroughfare of the village, is closely built up, nearly all of the buildings along the street as well as a very large majority of the residences are of frame construction. It is obvious that the protection afforded against loss by fire is very inadequate and consequently, fire insurance rates are high.

In 1909, an appropriation of $400 was voted by the taxable inhabitants to defray the expenses of an investigation to ascertain the cost and location of a municipal water supply system. Hydraulic engineers were employed and the surrounding country was thoroughly looked over. It was found that a gravity supply could not be obtained. None were available or practicable, and upon the report of the engineers, and after due consideration by the board of trustees, a plan was adopted by which it is now proposed to take a supply from driven wells in a large gravel pit on the Cook farm, about a mile outside of the village limits, where it is designed to sink a well some 12½ feet in diameter and 16 or 18 feet deep. The elevation at this point is about fifty-five feet above the business section of the village but considerably less in other parts.

The water from the wells is to be pumped through an eight-inch force main to an elevated tank on Wilkinson's hill, some 530 feet south of the corporation line. The pumping outfit will consist of two independent units, each consisting of a twenty-five horsepower gasolene engine, direct connected, with a single acting triplex pump, capable of pumping 350 to 400 gallons per minute through the force main to the tank. The surface of the ground on the Wilkinson's hill is only about seventy feet above the business section and only about twenty-five feet above the residential section of the village and in order to obtain a suitable fire pressure, it will be necessary to erect a tank elevated some 100 feet. This tank is to be of 100,000 gallons capacity and it is assumed this will give a reserve supply sufficient to maintain three streams for a fire of two or three hours' duration. The tank designed is a cylindrical shell twenty-two feet in diameter and twenty-eight feet high of riveted steel plate, with hemispherical bottom and conical roof, supported on four columns.

A distribution system has been planned covering all the streets in the village, upon which forty-six double nozzle hydrants have been provided for at distances varying from 270 to 500 feet apart. The hyrdants are generally located at block corners so that most of the buildings can be reached by short lines of hose from at least three hydrants and it appears from the examination of the maps filed, that every building within the village will have fire protection from this system. The mains of the system consist of 3,890 feet of ten-inch pipe, 5,250 feet of eight-inch pipe, 14,226 feet of six-inch pipe and only 1,850 feet of four-inch pipe. These sizes, considering the situation of the village and its financial ability, appear ample for domestic and fire service. A reduction in the sizes of some of the pipes would seriously impair the efficiency for fire protection. A pressure of about eighty-five pounds will be maintained at the hydrants in the business section with a full tank, or seventy-five pounds with the tank nearly empty. The maximum pressure in the extreme lower part of the village will be about ninety pounds and the minimum pressure at any hydrants in the high part of the village will be about sixty pounds.

Severe tests have been made to ascertain the quantity of water that could be obtained from the well at the Cook gravel pit. The first test showed 150 gallons per minute, pumping steadily for a week with two pumps in a dry time and on the second, pumping was continued for six days at the rate of approximately 82,000 gallons per day and at the end of the test the level of the water in the well had not been reduced. Both of these tests were made with the well seven by five feet and approximately nine feet deep, not the full size or depth of the well as contemplated by the plans.

As soon as the village authorities had accepted the plans of the engineers as most practicable and available for the village, they submitted the plans to the inhabitants of the village and these maps and plans were on file at the office of the trustees prior to the general village election which was held on the fifteenth day of March, 1910, and at that election the following propositions were submitted to the electors qualified to vote thereon, namely:

(5) "Shall $38,988 be paid from money raised by tax or assessment to build a system of water works in the village of Spencerport?"

(6) "Shall the village of Spencerport be authorized to borrow the sum of $38,988, to be paid from money raised by tax or assessment, or so much thereof as shall be necessary, upon the bonds of said village, payable in twenty-seven equal annual instalments, the first of which shall be payable September 1, 1913, for the purpose of building and installing a system of water works in the village of Spencerport?"

(7). "If the vote on propositions five and six is favorable, shall there be raised for preliminary expense of water works the sum of $1,200?"

All of these resolutions were adopted by a full vote of the electors.

Proposition No. 5 received 98 affirmative votes and 20 negative votes.

Proposition No. 6 received 94 affirmative votes and 21 negative votes.

Proposition No. 7 received 89 affirmative votes and 21 negative votes.

Since the election, no further objections to the plans as proposed have been made and no proceedings have been taken to set aside the vote or challenge the wisdom of the proposed plans as best suited to supply the necessities of the village, consideration being given to the elements of cost. The liberal detail estimates of the engineers show that the plant can be constructed for the amount appropriated by the electors.

The quality of the water from the well has also been submitted to several tests, both chemical and bacteriological. The first test that was made showed that the water to some extent was contaminated and that bacilli of the B. Coli type were present. In view of the fact that the well is dug in a very large gravel bank and that while the tests were being made cattle and men and horses were about the well, it is fair to assume that this contamination came from surface waters. The later tests show the absence of bacilli of the B. Coli type, though other bacteria were present; these later tests were also taken under adverse conditions; from the location of the well, and an examination of the surrounding territory, it is apparent that whatever contamination there is in the water must come from the physical surrounding, a condition that can be obviated as proposed by the plans. The water is of fair quality although somewhat hard, a defect that is found in all the ground waters of the locality. The water of this locality and of the well is not available for a domestic supply for any other municipality or civil division of the State.

The State Water Supply Commission therefore determines:

(1) That the plans proposed are justified by public necessity.

(2) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3) That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The State Water Supply Commission does hereby approve the map of the lands to be acquired by the village of Spencerport for a new or additional source of water supply and the profiles thereof showing sites and areas of the proposed reservoirs and other works, the profile of the aqueduct lines and the flow lines of the waters when impounded, plans, surveys and abstracts of official reports relating to the same, and the plan or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of the said lands and the execution of said plans.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all plans, maps, surveys, and other papers relating thereto, filed in its office in the city of Albany, this 10th day of May, 1910.

[L. S.]

HENRY H. PERSONS,
President.
CHARLES DAVIS,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 74.

Plattsburgh. (City.) Town of Plattsburgh, Clinton county.

Petition filed March 24, 1910.

Hearing held April 21, 1910.

Village taking water from West brook and Mead brook. Consists of a gravity system with two catchment reservoirs, also two distributing reservoirs, each 150 feet square with a capacity in each of 2,700,000 gallons. Fire hydrants in use. Cast iron or cement mains in nearly all streets.

Petition asked for approval of plan to build an additional reservoir on Mead brook with a capacity of 72,000,000 gallons, as the old dam was worn out. Population, 12,000.

Analyses showed the water to be unwholesome, moderately hard and bacteria of the B. Coli Communis type were present.

Total estimated cost of proposed project, $40,000.

The Commission denied the petition May 20, 1910.

Decision filed June 2, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of THE CITY OF PLATTSBURGH for right to obtain an additional supply of water.
} *Decision.*

Application filed: March 24, 1910.
Hearing: April 21, 1910.
Decision: May 27, 1910.

The city of Plattsburgh has a gravity water supply system established many years ago and extended and improved from time to time as necessity required. The sources of the supply are two streams known as the Mead brook and the West brook, on both of which, six miles distant from the city, are catchment reservoirs; from these the water is conducted about 1½ miles to a so-called well house, where the separate pipe lines are united and controlled, and from thence taken to twin, open, distributing reservoirs, each about 150 feet square, situate some three miles westerly from, and having an elevation of about 125 feet above, the city. From these open reservoirs, which when full hold about 2,700,000 gallons each, the water is sent by two pipe lines to the distributing system in the city limits. The streets of the city are nearly all supplied with either cast iron or cement mains and with fire hydrants well located.

The city was organized in 1902. Its population that year was 8,880. Its predecessor, the village of Plattsburgh, in 1890 had a population of 7,010, and in 1900, of 8,434. The city's population increased to 10,184 in 1905 and at the present time, the permanent population is variously estimated at from 12,000 to 13,000. Within the corporate limits there is a United States Government post, a State normal school and just outside, a large Catholic summer school and the Hotel Champlain. These establishments increase the resident population, especially during the summer vacation period, some 3,000, so that the city's water system is called upon to furnish a supply to from 15,000 to 16,000 people for domestic uses. Water is also furnished and in large volume to the Delaware and Hudson Railroad Company, the Plattsburgh Lumber Company, the Catholic Summer School and the Hotel Champlain; the two latter consumers being without the city limits.

The method employed by the city to support its water department and to derive a revenue from the use of water, is not entirely based upon the amount of water consumed by the user. While the large consumers, notably the United States Government, the Delaware and Hudson railroad, the Plattsburgh Lumber Company, the Catholic Summer School and the Hotel Champlain are metered, there are only forty-eight other meters installed upon the system. From all the other consumers a revenue is obtained by assessment based upon the assessed valuation of the property.

For example: Property valued at less than $1,000 pays $6 per year for water, valued from $1,000 to $2,000, $8 per year; from $2,000 to $3,000, $9 per year; from $3,000 to $4,000, $10 per year; valued at $4,000, $11 per year and valued over $4,000, $12 per year.

This plan produces a gross annual revenue of from twenty-five thousand dollars to thirty thousand dollars per year, which is more than sufficient to pay interest, maintenance and operation charges and to retire the water bonds as they become due. The unmetered consumer is left free to use or waste an unlimited amount of water. That there is serious waste and an excessively high daily per capita use of water is evidenced by the fact that in the summer time nearly three million gallons per day is delivered through the system.

Plattsburgh now has a total bonded indebtedness of $218,800, of which $170,-600 was incurred for the water system, the assessed value of the property of the city being in 1909, $3,395,895. The reservoir on the Mead brook was constructed about sixty years ago. Across the stream there is now an old earth and crib dam. This impounds about twelve milliom gallons of water, the watershed above the dam being seven square miles. During the year 1905 a concrete dam was erected on the West brook just west of the hamlet of West Plattsburgh, at an expense of nearly $50,000, and a reservoir created which impounds 22,000,000 gallons. The watershed above this dam is eight square miles. The city delivers these waters to its inhabitants and consumers in a raw condition, no filtration of any kind is made and for a long time the quality of the water has been a matter of grave public and private concern. During the year 1906, several bacteriological tests were made of the waters of both brooks under the direction of the Surgeon-General of the United States Army. These tests demonstrated that the water was impure and an examination of the physical conditions disclosed the causes, namely: Cesspools, outhouses, barnyards and other sources of contamination along the banks and in the vicinity of the streams. Early in January, 1907, the board of health of the city made investigations of the lands in the vicinity of the West brook which was then the chief source of supply, the city having for some time prior virtually abandoned the Mead brook as a source of supply except in emergencies, and found several existing sources of pollution, and in a resolution adopted by it and presented to the board of public works and to the common council of the city, declared the existing conditions along the West brook to be a menance to the health of the people of the city and recommended that the authorities acquire the lands in the watershed of the West brook and that in the opinion of the board this action was necessary for the protection of the public health of the city. No question was raised at this time as to the sufficiency of the supply. The board of public works and the common council adopted the plan outlined by the board of health and on January 19, 1907, the city filed with the State Water Supply Commission an application to acquire certain lands in the watershed of the West brook from the crest of the divide east and west of said brook and from the new dam on the West brook to the head of said West brook in lot No. 61, Duerville patent. After due advertisement and a public hearing held on the 14th day of February, 1907, in the city of Plattsburgh, the State Water Supply Commission on February 27, 1907, made and filed its decision as required by law, wherein and whereby the application as presented was in all respects approved. That determination of this Commission among other things said:

"At the present time it (Plattsburgh) takes its water from Mead brook and West brook. Situate upon the watershed of these brooks are many places of contamination. The nature and formation of the soil is such that after heavy rains, the water coming down from the steep hillside, through the farm yards, cess-pools, pig-stys, etc., carries into each of these streams a large amount of contaminating matter. The analyses which have been made from time to time, show that for these reasons the purity of the water is very much affected by heavy rain falls." * * *

"The watershed of West brook is covered with growing timber, although there are located along the stream many farms and buildings which are a constant source of contamination to the water supply of the city of Plattsburgh."

"The city, by this application, desires to abandon Mead brook as a source of supply and to purchase the entire watershed of West brook and remove therefrom every source of contamination and pollution. The analysis of water taken from this watershed, when uncontaminated, shows it to be an ideal potable water." * * *

"This application by the authorities of the city of Plattsburgh is a step in the right direction. It asks permission to own and control the watershed of West brook. Such a purpose on the part of the city of Plattsburgh, if it can be carried out, seems to the Commission to be most wise and commendable. The value of a pure source of water supply for a city cannot be too highly prized. The objection is often raised that the cost to a city of owning its own watershed is so great that it is practically prohibitive, but in this case the proof shows that the net profits of the present water system, in four or five years, will be sufficient not only to purchase the watershed of West brook, but to build a proper and sufficient storage dam. Any objection, therefore, from a cost point of view vanishes immediately. It is rare, indeed, that a city is so fortunate as to be able to purchase, without levying any additional burden whatever upon its inhabitants, such an ideal watershed, and to be able to say, not only to its own inhabitants, but to its summer visitors, in this case thousands in number, that it owns its entire watershed and that its water is absolutely free from foul and contaminating substances."

"It is also clear from the proof, that West brook, in ordinary years, will furnish sufficient water for the city of Plattsburgh, including the Catholic summer school, the United States government barracks and the Hotel Champlain; and when once it can say that its source is a pure source, it has greatly increased the attractiveness of that delightful region as a summer resort."

Nothing was done by the city to carry into effect this unqualified approval of its plan to safe-guard its water supply except that a special election of the city of Plattsburgh was held on the 7th day of April, 1907, for the purpose of voting upon the proposition contained in the following resolutions, namely:

"*Whereas*, This council and the board of health and the board of public works of this city have heretofore taken action to institute proceedings through the mayor and the corporation counsel before the State Water Supply Commission to acquire certain lands in the watershed of the West brook in the towns of Plattsburgh and Beekmantown for the purposes set forth therein;

"*Resolved*, That extraordinary expenditures ought to be made for the purpose set forth in the said resolutions and for the purposes set forth in the petition and application now before the State Water Supply Commission to acquire said lands in the watershed of the said West brook."

"*Resolved*, That it is the opinion of this council that in order to accomplish the purposes set forth in the said resolutions, petitions and applications, and to defray costs and expenses of acquiring the said lands in the watershed of the said West brook from the crest of the divide east and west of said brook, and from the new dam on the West brook to the head of the said West brook in lot 61 Duerville patent, that the sum of not exceeding $50,000 shall be needed to acquire the said lands and to cover the costs and expenses of searches of title, condemnation proceedings and court proceedings and for the purchase of the said lands and for all costs incidental thereto; for the construction of such reservoir or reservoirs as may be deemed necessary, for acquiring such other sources of water supply as may be deemed desirable to increase the city supply, and for such other purposes as may be necessary to increase, purify and protect the water supply of the city."

The whole number of ballots cast on the proposition was 187, of which 121 were in favor of the proposition, 62 against it and 4 blank or void ballots, and on April 15, 1907, the common council, meeting as a board of canvassers to canvass the vote of that election, declared the proposition adopted by the electors. Whatever reasons there were for further inaction on the part of the municipal authorities have not been disclosed.

The city now files a new application in which it alleges that by reason of the dilapidated condition of the present Mead brook dam, a large amount of water is wasted and that the supply from both brooks as derived from the present dams is not sufficient to furnish an adequate supply for domestic use and fire protection, especially during the summer months and desires authority to enlarge the present storage upon the Mead brook by building there a new reservoir of seventy-seven million gallons capacity and to acquire the necessary lands for such purpose. The new reservoir is proposed to be placed on the Mead brook above the old one, which it is to replace. The reason for making the change is that it is estimated to be cheaper to construct an entirely new reservoir than to attempt to rebuild the old dam and clean out the reservoir basin.

No maps or plans were submitted except a blue print showing the location and contours of the proposed new reservoir, estimated cost of the work being $40,000.

Upon receipt of this application the usual notice of a public hearing was given to be held at the city of Plattsburgh on April 21, 1910, prior to which time objections were filed to the application by several of the property owners affected by the proposed construction, by citizens of the city, by the board of public works and the board of health of the city, the material objections being the general unsanitary condition of the watershed of the Mead brook and its tributaries, the near proximity of numerous sources of contamination, and the cost of removing which was beyond the means of the city and that there were plans offering more desirable results. Upon the hearing, the city appeared by John K. Collins, Esq., the corporation counsel. The objectors appeared in person. Testimony was given which shows that the quantity of water that is now derived from the West brook is not sufficient in times of drought for all the needs of the city, its inhabitants and customers outside of the city limits, and during such times of drought the available waters of the Mead brook are used to augment the supply from the West brook and that in the summer of 1909, street sprinkling was stopped and the citizens were notified to use water with caution.

On the Mead brook, the proposed source of additional supply, and in close proximity to the stream there are nine groups of buildings from which the surface water and barnyard drainage flows directly into the brook. In one instance, immediately above the proposed reservoir, the stream passes through a barnyard. In addition to these buildings, near the stream there are some twenty-five or thirty others in the watershed, the majority of which are located near the stream and which tend to the pollution of its waters. The lands through which this brook flows for two miles above the proposed reservoir are nearly all cultivated, meadow or pasture lands. The remainder of the watershed is covered with second growth timber and is rocky and rough side hill. The water of the stream is unwholesome. One capable witness said: "It was filthy," and another equally capable, described it as "nasty." The analysis made by the State Board of Health indicated the presence of a large quantity of undecomposed organic matter, evidently largely of vegetable origin as the chlorine value was very moderate and the color value somewhat high. The water contained large particles of suspended matter. The water was moderately hard, the hardness being mostly temporary in character and produced by bicarbonates of lime and magnesia. The bacterial count was high. Bacilli of the B-Coli type were present, and in fact the water is such as cannot be approved for use as a public supply.

In order to make this water pure and wholesome, one of two methods would have to be adopted. First, the acquisition and removal of all buildings, cattle yards, outhouses and other sources of contamination that are within the danger line along the stream. Second, the establishment and operation of a filter plant. Neither of these is provided for by the plans presented; nor is it contemplated that the amount of money proposed to be expended for the additional supply from the Mead brook will be sufficient to accomplish more than the construction of the proposed reservoir.

For these reasons, the present application of the petitioner is rejected. The plans proposed by this application are not justified by public necessity. It is proper to add here that under present conditions with practically an unmetered supply, with charges for water used, not governed by the amount of water consumed and with the burden on the plant of supplying water for railroad purposes and to consumers without the city, that the city of Plattsburgh needs more water during dry summer months than the system as at present constructed can produce and without a change in these conditions more water should be obtained, though the testimony shows that for all periods except these dry summer months, there is an abundant supply of water for fire and domestic purposes.

The West brook from which this supply is now entirely taken, has a larger watershed than the Mead brook and is largely covered by second growth timber. The land is rocky and large areas of it are untillable. The proximity of a few dwellings and barns near the banks of this stream is a possible source of contamination to this supply. The flow of the water in the stream is at least double that in the Mead brook and while the flow is greatly reduced during the summer months, the brook does not become dry at any time.

If the city of Plattsburgh will carry into effect the decision heretofore rendered upon the previous application and acquire the lands upon the West brook there described and do the work contemplated by that application, all of which it may do without further application, it can, with that watershed thus protected, obtain from the West brook an abundant supply of wholesome water sufficient for all its present needs and with proper storage and regulation sufficient for a city of 50,000 population.

As the present application is denied upon the ground that the plans as presented are not justified by public necessity, it does not become necessary to make the other determinations required by the statute.

The State Water Supply Commission does hereby reject the application of the city of Plattsburgh entirely.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and rejection to be signed by the Commission and caused its official seal to be affixed hereto and the same with all plans, maps, and other papers relating thereto filed in its office at the city of Albany this 27th day of May, 1910.

[L. S.]

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
CHARLES DAVIS,
State Water Supply Commission.

APPLICATION NO. 75.

CROTON-ON-HUDSON. (Incorporated village.) Town of Cortlandt, Westchester county.

Petiton filed April 6, 1910. Tax election held later.

Hearings held July 15 and August 10, 1910.

Village had no public water supply system, taking its water from springs and dug wells.

Petition asked for approval of plan to take water from Croton river; an intake system of wells to be dug on north bank in gravel soil. Amount of proposed supply estimated at 100,000 to 750,000 gallons daily to serve a population of about 2500. Reservoir located in easterly part of village to be built of reinforced concrete founded on ledge rock, with a capacity of 750,000 gallons. Water to pass through a bed of sand and gravel. Pressures; maximum, 140 pounds; minimum, 60 pounds. Three and one-half acres of land to be acquired. Fire hydrants.

Analyses showed that water was soft, but there were present bacteria of the B. Coli Communis type.

Total estimated cost of proposed project, $75,000.

The Commission approved the plan of the applicant August 24, 1910.

Decision filed August 24, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter

of

The Application of the VILLAGE OF CROTON-ON-HUDSON for approval of its maps, plans and profiles for a new water supply system. } *Decision.*

Application filed: April 6, 1910.

Hearing at Croton-on-Hudson: July 15, 1910.

Decision: August 24, 1910.

Nathan P. Bushnell, Esq., appeared for petitioner.

Frank L. Young, Esq., for water commissioners of village of Ossining.

Franklin Couch, Esq., for Van Cortlandt estate.

Croton-on-Hudson was created a municipal corporation in 1898. It is situate on the east shore of the Hudson river, just north of the Croton river in the town of Cortlandt, Westchester county. Its population as shown by the village enumeration taken in 1906 was 1,713 and its estimated present population is upwards of 2,000. The assessed value of the property within the village is $970,000 and its only debt $1,500. Up to the present time the inhabitants have relied entirely upon wells and cisterns for municipal and domestic supplies. In June, 1910, the board of trustees of the village, who are its water commissioners, decided to install a municipal plant, and at a special election held in the vllage on the 21st day of June, 1910, the propositions to establish a municipal system for fire and domestic purposes at a cost of $70,000 were practically unanimously adopted.

Following the examination, report and recommendation of its engineer, the Board of Water Commissioners of the village have proposed the following plan to carry out the wishes of its taxable inhabitants.

The supply for the village is to be obtained through tubular wells driven in the gravel and sand strata lying along the north bank of the Croton river at a point about 1,500 feet south of the new Croton dam of the city of New York and about 100 feet north of the Croton river; to unite the wells, build a pumping station and force the water through a 12-inch main to a reservoir of about 750,000 gallons capacity, from which the water will be drawn by 12 and 10-inch iron pipe lines to the distributing system, covering all the streets in the village and furnishing a fire protection at about 100 pounds pressure. To connect with the system approved fire hydrants located from 300 feet to 400 feet apart so that every building in the village but one will be protected.

The only land required to be taken will be about two acres for the pumping plant and one and one-half acres for the reservoir site.

The estimates of the total cost of the plant are within the amount appropriated by the village. The system will be capable of furnishing from 100,000 to 750,000 gallons per day as the needs and growing necessities of the community may demand.

As designed, this system has the approval of the Commission.

No objection was made or filed to the application as here presented. The village of Ossining, however, appeared by counsel upon the hearing and it was urged in its behalf that the taking of the proposed quantity of water from the watershed would injuriously affect the rights which the State Water Supply Commission had granted to that village in the Croton river by its determination under date of November 26, 1907, in the matter of the application of the village of Ossining for an additional supply of water. This objection was met by the testimony taken upon the hearing and by the results of subsequent stream gagings of the Croton river. From this evidence it appears that the new Croton dam of the city of New York, while it reaches an elevation of 200 feet above high water and goes down 100 feet below the surface and into the solid rock, with rock at both sides, does not prevent the seepage under this dam of a very large amount of underground water, variously estimated from four to five million gallons per day, and which finds its way into the Hudson river either through the Croton river or by underground courses. Below the Croton dam the river bed is free from water. It begins to show some 300 feet or 400 feet below it, bubbling up through the gravel. At a point about one-half a mile below the foot of the dam and opposite the place where the village of Croton-on-Hudson proposes to sink its wells there is a considerable stream of water. The gaging taken in August, 1910, shows, after a long continued dry period and without any water flowing over the Croton spillway, that more than two and one-quarter million gallons per twenty-four hours were flowing in the Croton river. Still further down the river and at the site of the proposed dam of the village of Ossining, the flow for the same time and period was more than two and one-half million gallons. Undoubtedly the underground flow is increased by the storage of the vast amount of water in the Croton reservoir. In no other way could the large flow of the Croton river below the dam be accounted for, the watershed of the river and of the small brooks which flow into the river below the dam would not under usual and general conditions be capable of producing so large a runoff in dry weather.

No municipalities or civil divisions of the State, other than Ossining, are affected by the plans of the applicant. Peekskill, on the north of Croton-on-Hudson, has an abundant water supply taken from other sources; Montrose is only a small hamlet with few houses, and for Yorktown Heights, with a population of about 800, unincorporated and distant some six miles to the east of the proposed pumping station, these waters are not available. There is abundant proof that the quantity of water available for Ossining and Croton-on-Hudson in the Croton river and from the ground waters within the watershed of the Croton river below the Croton dam, is sufficient for a population many times that of Ossining and Croton-on-Hudson combined.

The so-called village or city of Harmon is not a municipality though streets have been laid out and some eight or ten houses erected and it has promising possibilities for growth and development; there is no demand for a municipal water supply. When such demand arises, these underground waters will undoubtedly furnish it an abundant quantity.

The proposed water is soft and pure and suitable in all respects for a municipal and domestic supply as is shown by the chemical and bacteriological investigations.

The State Water Supply Commission therefore determines:

FIRST: That the plans proposed by the village of Croton-on-Hudson for a new water supply system are justified by public necessity.

SECOND: That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The State Water Supply Commission does hereby approve the maps and profiles of the lands to be taken by the village of Croton-on-Hudson for a new water supply system and does hereby approve the application and plan of the said village, and the plan or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of the said lands and the execution of said plans.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same with all plans, maps, surveys and other papers relating thereto, filed in its office in the city of Albany, this 24th day of August, 1910.

[L. S.]

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 76.

Harrison. Water district No. 1. Town of Harrison, Westchester county.
Petition filed April 19, 1910.
Hearing held May 6, 1910.

Village was formerly supplied from wells, installed and operated by West Harrison Water Company. The system consisted of a pumping plant, tank holding 20,000 gallons and distributing mains. These have become worn out and abandoned.

The petition asks for approval of plan to take water from springs in the vicinity of Silver Lake. The plans contemplate sinking a tank about fifteen feet in ground and consisting of two concentric steel cylinders perforated, the space between cylinders filled with gravel to act as filter. Pumping plant, triplex pumps, with a capacity of 105 gallons a minute. Elevated tank of 45,000 gallons capacity located on highest point in district connected with pump by an eight-inch main. Distribution mains from four to eight inches. One and one-half acres or more to be acquired.

Analyses showed the water to be good and potable.

Total estimated cost of project, $40,000.

The Commission approved the plans of the applicant May 20, 1910.

Decision filed same date.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Harrison Water District No. 1, in the town of Harrison, Westchester county, for approval of its maps, plans and profiles for a new or additional source of water supply.

} *Decision.*

Application filed: April 19, 1910.
Hearing at White Plains, N. Y., May 6, 1910.
Decision: May 20, 1910.

This matter came on for public hearing at the courthouse, in the village of White Plains, Westchester county, N. Y., on the 6th day of May, 1910.

Charles A. Dryer appeared for the applicant, and the applicant was also represented by the following-named members of the board of water commissioners of the said water district: Mr. Edward C. Gainsborg, president, and Messrs. Joseph Piskule and Max Winkler.

No objections were filed to the petition, and no one appeared in opposition.

The applicant was duly established as the Harrison Water District No. 1 by resolution adopted by the town board of the town of Harrison, March 12, 1910.

The population of the water district, as shown by the evidence, is approximately 325, and its assessed valuation, as appears from the last assessment-roll of the town of Harrison, $222,600. There are about sixty residences within the water district at the present time, most of them frame structures.

The water district was formerly supplied with water from a private system installed about seventeen years ago and operated by what was known as West Harrison Water Company. The supply was taken from wells and the system consisted of a pumping plant, a tank of a capacity of about 20,000 gallons and a distributing system in some of the streets. That plant became worn out and was abandoned, and the inhabitants of the district are now without a water supply either for domestic use or fire protection; the secretary of the West Harrison Water Company appeared in behalf of this petition upon the hearing and stated that the company were in favor of this application and would make no claim for damages.

The water district propose to install a new system by sinking a receptacle about fifteen feet deep to collect the water from springs in the vicinity of St. Mary's or Silver lake. This receptacle is to consist of two concentric steel cylinders, perforated, and the space between the cylinders to be filled with gravel to act as a filter. From this well, the water is to be pumped directly through an eight-inch main to a tank located on a steel tower on the highest point in the district. The pumps are triplex, with a capacity of 105 gallons per minute. The tank is to have a capacity of 45,000 gallons. The water is to be delivered to the district either direct from the pump or from the tank through mains ranging in size from four to eight inches.

The system is to be supplied with forty-five hydrants, which are considered sufficient to enable every residence in the district to be reached by the use of not more than 500 feet of hose. The pressure at each hydrant will be sufficient to afford ample fire protection for the entire district. The district is to acquire about an acre and a half where the springs are located and where the pumphouse is to be, and a sufficient amount of land where the tank is to be located.

Since this supply is taken from springs within the district, it does not appear that any other municipality or civil division will be affected by the carrying out of these plans, neither does it appear from the evidence taken on the hearing that there will be any instance of indirect damages.

While the establishment of the district provided that not to exceed $100,000 might be used for the purpose of installing a water system, the evidence of the engineer indicates that they would not need to use to exceed $40,000 at the present time. A $40,000 bond issue on a valuation of $222,000 appears excessive, but the evidence produced before the Commission indicates that there will be an increase in value of this district of about 40 per cent. in the next year and a half on account of the installation of this system and the necessities of the district seem to warrant the expenditure. A bacteriological and chemical analysis furnished indicate the water to be a good potable water for domestic purposes.

The State Water Supply Commission does hereby approve the application of the petitioner and hereby determines:

(1) That the plans proposed are justified by public necessity.

(2) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof,

particular consideration being given to their present and future necessities for sources of water supply.

(3) That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

[L. S.] IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all plans, maps, surveys, and other papers relating thereto, filed in its office in the city of Albany, this 20th day of May, 1910.

HENRY H. PERSONS,
President.

CHARLES DAVIS,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 77.

GREENWICH. Union Water Works Company. Towns of Greenwich and Easton, Washington county.

Petition filed April 29, 1910.

Hearing held May 11, 1910.

The Company is a private corporation organized in 1887, for the purpose of furnishing water to the village of Greenwich.

Present source of supply is Fly creek. Two reservoirs, the first one with a capacity of 7,000,000 gallons and the second 2,500,000 gallons. The distributing system consists of about 25 per cent. of eight-inch pipe, 35 per cent. of four-inch pipe, and 40 per cent. of six-inch pipe and fifty hydrants.

To increase the supply which for the past two years has been insufficient, the petition asked for approval of plan to build a third reservoir on Hill creek with a capacity of 30,000,000 gallons, also a filtration plant of the slow sand filtration type to be located at the reservoir. Gravity system.

Analysis indicated the water to be a good water for domestic uses. The bacteriological examination showed the presence of bacteria but no B. Coli.

Population, 2500.

Total estimated cost $45,000.

The Commission approved the application May 11, 1910.

Decision filed May 11, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the GREENWICH UNION WATER WORKS COMPANY for approval of its maps and profiles of its proposed new reservoir and source of additional water supply.
} *Decision.*

Petition filed: April 29, 1910.

Hearing: May 11, 1910.

Decision: May 11, 1910.

This matter came on for public hearing at the office of Van Ness and Maynard, in the village of Greenwich, Washington county, N. Y., on the 11th day of May, 1910. Van Ness and Maynard and also Henry Gray, president of the company, appeared for the petitioner. No objections were filed and no one appeared in opposition.

The Greenwich Union Water Works is a domestic corporation organized under the laws of the State of New York, in 1887, with a capital of $30,000, to furnish water for domestic and fire purposes to the village of Greenwich, an incorporated village, having a population of about 2,500 people and located in the towns of Greenwich and Easton, Washington county.

The present property of the company consists of a distributing system in the village and two reservoirs. What is known as Number 1, was constructed about 23 years ago and has a watershed of one-half square mile and the reservoir capacity is 7,000,000 gallons. Number 2 was constructed about 12 years ago and has a watershed of five square miles and a storage capacity of about one-half million gallons. It is impossible to increase the storage capacity of reservoir Number 2 without interfering with the grade of the Johnstown and Gloversville railway. The elevation of reservoir Number 1 is 212 feet above the hydrant in front of the Hamilton House; Number 2 is 153 feet above the same point.

The distributing system consists of about 25 per cent. of 8-inch pipe, 35 per cent. of 4-inch pipe, 40 per cent. of 6-inch pipe and 50 hydrants, the location of which were fixed by the village board. During the past two seasons the supply of water has not been sufficient and the company has been obliged to make arrangements with manufacturing concerns in the village to pump water from the Battenkill into the mains. There has been serious objection to this because the water of the Battenkill is contaminated and not deemed proper water to use for domestic purposes without boiling.

The proposition of the company is to construct a third reservoir on what is known as the Hill brook, located 10,000 feet from the present pipe line, of 30,000,000 gallon capacity, which will be fed from a watershed 4½ square miles. It is also proposed to protect the watershed from contamination to some extent and also to construct a filtration plant of the slow sand filtration type. This reservoir Number 3, it is estimated would furnish a supply for the village of Greenwich for 100 days in case no water was running in the stream. The elevation of reservoir Number 3 is 152 feet above the hydrant in front of the Hamilton House. It is proposed to bring water from reservoir Number 3 to the main system through a 12-inch cast-iron pipe. The estimated cost of the improvement is $40,000 to $45,000, and the company proposes to issue its bonds to secure the necessary funds. They also state they have arrangements made for placing the bonds.

It does not appear that any other municipality or civil division of the State will be affected by the taking of this water.

The analysis of the water indicates that with filtration, it will be a safe water for domestic purposes.

The State Water Supply Commission does hereby approve the application of the petitioner and hereby determines:

(1.) That the plans proposed are justified by public necessity.

(2.) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3.) That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the [L. S.] same with all plans, maps, surveys and other papers relating thereto, filed in its office in the city of Albany, this 11th day of May, 1910.

HENRY H. PERSONS,
President.
JOHN A. SLEICHER,
CHARLES DAVIS,
Commissioners.

APPLICATION NO. 78.

Black River. (Incorporated village.) Towns of LeRay and Rutland, Jefferson county.

Petition filed May 3, 1910.

Hearing held May 20, 1910.

Village has no public system of water supply and depends on wells and cisterns for their potable water. There is a system of four-inch wrought iron pipes laid in milling district for fire protection. This system is connected with pumps situated in the mills and takes water from the Black river.

Petition asked for approval of plan to take water from a spring, giving a supply of 100,000 gallons daily which with several other springs forms Drake creek. The plans propose building a dam across Drake creek and create a small intake reservoir and install a pumping plant operated by electrical or other power with a capacity of 150 gallons per minute. Also to build a reservoir of 300,000 gallons capacity, 229 feet above village where the water not used will be stored. The distributing system consists of 9,000 lineal feet of four-inch cast iron pipe, 7,400 feet of six-inch, 1,600 feet of eight-inch, 4,500 feet of ten-inch, twenty-eight hydrants and necessary gates and valves. Analyses showed the water to be potable if protected from the local contamination. There was a very moderate amount of organic matter present but no bacteria of the B. Coli Communis type.

Population, 1,000.

Total estimated cost, $27,000.

The Commission approved the application May 20, 1910.
Decision filed June, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the VILLAGE OF BLACK RIVER for the approval of its maps, plans and profiles for a new and additional water supply.
} *Decision.*

Petition filed: May 3, 1910.

Hearing: May 20, 1910.

Decision: May 20, 1910.

The matter came on for a public hearing at Fireman's Hall, in the village of Black River, May 20, 1910, at 10 A. M.

William E. Brown, president of the village, and Water Commissioners *H. C. Dexter*, *M. M. MacGruer* and *Fred W. Carpenter*, appeared for the applicant.

No objections were filed and no one appeared at the hearing in opposition.

The village of Black River is located in the towns of LeRay and Rutland, in the county of Jefferson, and was incorporated under the General Village Laws in 1891. It has a population of about 1,000, and in 1909 the assessed valuation, exclusive of exemptions, was $326,840. It has no present bonded indebtedness, and raises about $2,000 annually for village expenses. The tax rate is about $7 per 1,000. and the property appears to be assessed at about one-third its actual value.

The buildings are largely of frame construction, and the village has some manufacturing plants consisting of a paper mill and chair factories.

The present domestic supply is entirely from wells. For fire protection they have what is known as a dry system, which consists of wroughtiron pipes laid on or near the surface of the ground, connected with factory pumps which pump water from the Black river in case of fire. If fires occur in winter, the water usually freezes in the pipes and renders them useless for the balance of the winter.

The village, at an election held September 28, 1909, voted to establish a municipal water system, and issue bonds for $27,000 to defray the expense of same. The water commissioners propose to take water from a spring located about 7,200 feet from the center of the village near a small stream known as Drake's creek. This spring has a flow of 100,000 gallons per 24 hours, and the water is good potable water if protected from local contamination. There is also a second spring near this one of about the same capacity which could be easily connected with the system. Drake's creek, which these springs feed, has a flow of from 700,000 to 750,000 gallons per 24 hours. The waters of this creek are contaminated by the use of the lands adjacent to it for pasturage purposes. The Commission cannot authorize the use of the creek as a source of supply unless the village acquire the watershed and keep it free from contamination. The plan is to wall in the first mentioned spring to protect it from contamination and conduct the water into a small intake reservoir, install a pump of 150 gallons per minute capacity, and pump the water direct to the village and also to a reservoir of 300,000 gallons capacity, at an elevation of 229 feet above the village.

The distributing system consists of 9,000 lineal feet of 4-inch cast-iron pipe, 7,400 feet of 6-inch, 1,600 feet of 8-inch, 4,500 feet of 10-inch, 28 hydrants, and necessary gates and valves. The plan shows they are to have 9 dead-ends in their system, which is undesirable, but they seem unavoidable on account of the existing conditions.

It is apparent that if the village ever needs a greater supply than can be obtained from these springs, it could acquire the watershed of Drake's creek and have a supply sufficient for four times the present population.

It does not appear that the taking of this water will interfere with the present and future needs of any other municipality or civil division of the State, neither does it appear that there will be any indirect damages, on account of the taking of this water, to persons or property.

The analysis of the water indicates that with proper protection it will be safe for domestic purposes.

The State Water Supply Commission does hereby approve the application of the village and hereby determines:

(1.) That the plans proposed are justified by public necessity.

(2.) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3.) That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the [L. S.] same, with all plans, maps, surveys and other papers relating thereto, filed in its office in the city of Albany, this 20th day of June, 1910.

HENRY H. PERSONS,
President.

CHARLES DAVIS,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 79.

BELFAST. Water District. Town of Belfast, Allegany County.

Petition filed May 26, 1910. Hearing held on June 14, 1910.

The village has no public water supply system, depending on wells and springs, and for fire protection there is a hand engine which pumps water from several cisterns. The Water District, established January 12, 1910, has a population of about 1,000.

Petition asked for approval of plan to obtain water from driven wells, situated a mile and a quarter from and 187 feet above village. Test wells have been driven which showed a yielding capacity of 360,000 gallons daily. A concrete reservoir will be located near wells with a capacity of 300,000 gallons. Water to be piped to water district through an eight-inch cast iron main and six-inch and four-inch pipe to be used in distributing system connecting with thirty-four hydrants. Maximum pressure, eighty-one pounds. Minimum pressure, seventy-eight pounds.

Analyses showed the water to be satisfactory for domestic purposes.

Total estimated cost of project, $30,250.

The Commission approved the application July 7, 1910.

Decision filed July 7, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Water Commissioners of the Water District of the Town of Belfast, Alleghany County, for the approval of its maps, plans and profiles for a new or additional source of water supply. } *Decision.*

Petition filed: May 26, 1910.

Hearing: June 14, 1910.

Decision: July 7, 1910.

This matter came on for public hearing at Fireman's Hall in the village of Belfast, June 14, 1910.

Edward Rutherford, Esq., attorney, appeared for the applicant, and Water Commissioners *P. F. Loftus, George J. Fisk* and *H. B. Van Vleet* also appeared.

No objections were filed and no one appeared in opposition.

Evidence was presented showing that the town board of the town of Belfast on petition of the majority of the inhabitants established the Belfast Water District, comprising about one square mile, January 12, 1910. The boundaries of the district are substantially the boundaries of the unincorporated village of Belfast, which has a population of about one thousand. It appears that the assessed valuation of the property within the water district for 1909, is $244,595 and that the tax rate is about $11 on $1,000. It also appeared that the water district or town have no present bonded debt. The water district consists largely of residences with one or two small manufactories and the buildings are mostly of frame construction.

In August of 1909, the village suffered a very disastrous fire which resulted in a loss estimated at $50,000 to $60,000.

The present supply of water for domestic purposes is entirely from wells and springs. A few cisterns in the streets which are supplied from the roofs of adjacent buildings furnish the supply for fire protection. Their fire apparatus consists of one old-fashioned hand engine. It appears from the evidence that many of the inhabitants have no wells on their property but are obliged to go to their neighbors for water for domestic purposes. It is very apparent that this district is in need of a better water supply.

The petition of the taxpayers of the water district provided for the expenditure of $45,000 to establish the water system.

The application before this Commission proposes a plan which is to cost only about $31,000. The plan proposed by the petitioner is to sink deep wells on a hill about one mile from the center and at an elevation of 187 feet above the village and to pump the water from these wells into a reservoir, situate near the wells, with a capacity of 300,000 gallons and to pipe it to the water district through an eight inch cast iron main and to use in their distributing system six and four-inch cast iron pipe. It is proposed to locate thirty-four hydrants in the district, which will be so located that they will be within 500 feet of every building in the district with the exception of one or two in the outlying territory. The pressure at the hydrant in the center of the district will be 81 pounds to the square inch and at the highest hydrant in the district, it will be 78 pounds. The proposition is to sink five wells and the evidence shows that with the installation of the proposed pumps, they can furnish 360,000 gallons in twenty-four hours.

If the engineer's plans are carried out, it will undoubtedly furnish a good gravity service for this district. The analysis shows the water to be of good quality for domestic purposes.

It does not appear that any other municipality or civil division of the State will be affected by the taking of this water.

While the petition does not provide for the payment of indirect damages, neither does it appear that there will be any, however, the president of the water board stated, under oath, that in case any claim for indirect damages arose, the board or their counsel, would not object to the introduction of evidence showing same.

The State Water Supply Commission does hereby approve the application of the water commissioners of the water district of the town of Belfast and hereby determines:

(1.) That the plans proposed are justified by public necessity.

(2.) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

(3.) That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

[L. S.] IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all plans, maps, surveys, and other papers relating thereto, filed in its office in the city of Albany, this 7th day of July, 1910.

HENRY H. PERSONS,
President.

CHARLES DAVIS,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 80.

Moravia. (Incorporated village.) Town of Moravia, Cayuga county.

Petition filed July 6, 1910.

Hearing held July 22, 1910.

Present source of supply of village is from springs in towns of Summerhill and Locke and one in town of Moravia. A reservoir is situated on the hillside east of the village at such an elevation as to maintain a pressure in the main streets of seventy-five pounds per square inch. It is constructed of masonry and is 112 feet by 72 feet and 12 feet deep with a capacity of 700,000 gallons and the water from the springs is conducted into it through three-inch and four-inch pipes. A ten-inch pipe connects the reservoir with the main distributing pipes and the system is well equipped with fire hydrants, valves, etc. The pipes are of cast iron and consist of 12,700 feet of four-inch pipe, 1,440 feet of six-inch pipe, 1,000 feet of eight-inch pipe and 2,200 feet of ten-inch pipe. When supply was insufficient, water has been pumped from driven wells which are subject to contamination. There is no filtration plant.

Petition asked for approval of plan to purchase springs on the farm of Lamar Close, conduct water through pipes to a small concrete reservoir and from there through a three-inch pipe to the pipe leading to distributing reservoir. To protect springs from surface drainage, a concrete or other tight masonry curb is to be built around them with concrete top and locked iron manholes.

Chemical and bacteriological examinations of the springs show them to be pure and free from bateria of the B. Coli Communis type and of a degree of hardness not objectionable for domestic use.

Total estimated cost of proposed project, $3,500.

The Commission approved the application August 24, 1910.

Decision filed August 24, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Village of Moravia to acquire an additional water supply.
} *Decision.*

Application filed: July 6, 1910.

Hearing: July 22, 1910.

Decision: August 24, 1910.

On July 6, 1910, the village of Moravia filed with the Commission an application for the approval of its maps and profiles for an additional source of water supply for that village. Pursuant to the public notice given on July 7, 1910, and published in the Moravia Republican Register, the Commission met at the First National Bank in the village on July 22, 1910, for the purpose of hearing all persons and municipalities affected by the application.

Taber and Brainard (Mr. F. P. Taber) appeared as attorneys for the applicant. Mr. John P. O'Hara, president of the village, and Messrs. *Tuttle, Ward and Cady*, trustees of the village, also appeared in person. No objections were filed.

The village of Moravia is situate in the town of Moravia, Cayuga county, upon a small creek known as Owasco inlet, four miles southerly of Owasco lake and upon the watershed adjacent to that lake.

The village was incorporated as early as 1837 by special act of the Legislature, reincorporated in 1859, its charter revised in 1891, and in 1908, by a vote of its inhabitants, became a village under the General Village Law.

The population, according to the enumeration of 1905, was 1,489. It is not estimated at more than that number at the present time. In fact, there has been no substantial increase since 1890, when the enumeration showed 1,486 inhabitants. The township of Moravia has, however, increased in population during the period named, 1890–1905, from 1,881, in 1890, to 2,315, in 1905. No new buildings have been erected in the village, with possibly one exception, during the past four or five years. There is but one manufacturing establishment, and the general business of the village is supported almost entirely from the surrounding farming district.

In 1885 the Moravia Water Works Company constructed a water system to supply the village and its inhabitants and continued to own and operate the plant until May 1, 1910, when the village purchased the property of the company for $36,500. At the time of its purchase this property comprised a distributing system in the streets of the village, a storage reservoir and site, several springs, pipe lines, rights of way and an auxiliary pumping plant, land and wells. The distributing pipes are all cast iron and consist of 12,700 feet of 4-inch pipe, 1,440 feet of 6-inch pipe, 1,000 feet of 8-inch pipe and 2,200 feet of 10-inch pipe, the latter extending from the reservoir down to the street system, connected with which are thirty-two hydrants and the usual valves and gates. The reservoir is situate on the hillside east of the village and within the village limits. It is constructed of masonry and it is 112 feet by 72 feet and 12 feet deep. Its capacity is about 700,000 gallons, about one week's supply, and gives a pressure in the flat portion of the village of about 75 pounds per square inch and is so constructed that the surface drainage cannot find its way into it.

The springs, the sources of supply, are five in number. One is located in the town of Moravia about one mile east of the reservoir and four are in the adjoining town of Summerhill, about four miles southeast of the village. These springs are each enclosed within rubble masonry walls, covered with flat wooden roofs, notwithstanding which they have been and still are liable to contamination from surface waters and drainage from many sources of pollution in the immediate surroundings. The water from the springs is piped to the reservoir through 1,200 feet of 2-inch pipe, 15,200 feet of 3-inch pipe, and 1,500 feet of 4-inch pipe. During part of each year these springs have delivered sufficient water to supply the needs of the village and there have been times when the waters in the reservoir overflowed, but each year, during the dry period, they fail to furnish an adequate supply. The superintendent of the water company, who has been in charge of the system for ten years past, testified: "We never have had quite enough water."

When the yield of these springs has been insufficient, the supply has been augmented, at a cost of about $300 per year, by pumping water directly into the mains from driven wells situate in the northwest part of the village west of the railroad tracks, and in the flat valley of the Owasco inlet, which is subject to more or less flooding and contamination. There are two 4-inch wells, one driven to a depth of 42 feet and the other to a depth of 150 feet. The water in each of these is very hard and rises to within two feet of the surface.

The Water Works Company furnished about 250 places with water through about 220 taps. Allowing five persons to each family, there are now about 1,250 water consumers, and as there is no great industrial consumption of water, a fair per capita use of 100 gallons daily would mean that 125,000 gallons should be put in the reservoir every twenty-four hours. It is quite evident that the springs do not at all times furnish this quantity of water, though it is an actual fact that at times when the springs furnish enough water to keep the pipes flowing full, the reservoir overflows. The water from the system has been furnished to the consumers without filtration of any kind. In February and March of 1910 the village experienced an epidemic of typhoid fever; some twenty-nine cases developed in the village and the surrounding territory. The local authorities caused examinations to be made of the physical condition of the water supply and chemical and bacteriological examination of the spring water, and it was found that the situation of the spring was such as to invite rather than ward off pollution, and that the water was highly contaminated, bacteria of the bacillus coli communis type being present in almost every test. On February 26 the board of trustees of the village decided to submit to the electors of the village the following proposition: "Shall the village of Moravia issue bonds in the sum of $40,000 for the following purposes: $36,500 for the purchase of the Moravia Water Works system and $3,500 for necessary improvements to said system"— and at the village election held on March 15, 1910, the propostion was adopted by a vote of 117 in favor of to 67 against the same. Following this vote and in conformity therewith the plant and property of the water company was purchased, and on May 1st of this year taken into the custody and control of the village authorities.

Immediate steps were taken to protect and improve the water supply, the use of several of the smaller springs was discontinued and new concrete curbs built around the two best springs for conserving all of the water that it is possible to obtain from them and for the further purpose of protecting them against contamination from surface water. The trustees decided to abandon the use of the wells in the village and to obtain an additional supply from some other source, and after investigation and report from its engineer this application was made for the purpose of obtaining an additional supply from springs situate in the adjoining town of Locke and within a short distance of the present intake pipes.

The proposed new source of supply is a series of springs on the farm of Lamar Close, situate on the south side of the Dry Creek valley and about two and one-half miles from the village reservoir and about one mile southwesterly from the old springs situate in the town of Summerhill. It is proposed to lead the water from these new springs through pipes to a collecting basin or small concrete reservoir and from the latter to lay a 3-inch pipe connecting with the present 3-inch pipe leading to the distributing reservoir.

Following the hearing held by the Commission in the village of Moravia it has caused an examination of the present system and the proposed new source of supply and the maps, plans and profiles of the village to be made by its engineer, whose report upon the subject has been filed in the office of the Commission.

Chemical and bacteriological examinations of the waters of the proposed springs show them to be pure and free from bacteria of the bacillus coli communis type and of a degree of hardness which will not render them objectionable for domestic use.

Upon the Close farm are nine springs. In August, 1910, four of the nine were entirely dry; the other five were flowing. When gaged in May, 1910, by the village engineer the yield was found to be 60,000 gallons per day. The present nonflowing streams appeared to be outlets for surface drainage only in winter and spring or after heavy rains and it is not advisable that the village shall attempt to use these so-called springs.

The temperature of the water taken from the flowing springs is about 40 degrees, and from engineer's report it would appear that but two of the springs are safe for the village to use, and then only provided a proper concrete or other tight masonry curb is built around them with a concrete top and locked iron manholes, and due precaution taken to exclude all possibility of surface drainage getting into the water. The other three flowing springs are probably safe for use and could be used if it is found that the other two are not sufficient to make up the deficiency in the present needs of the village, provided the same precautionary measures are taken to protect them from surface pollution. While there is evidence to show that the village has not spared expense in its endeavor to protect two of the old springs from contamination and that the work has been well done, no safeguards whatever have been provided for the other one of the old springs, known as the Harris spring. The plans of the village for its additional supply are, therefore, modified so as to provide the same plan for protecting the Harris spring as has been employed at the other two old springs, and also so as to provide for concrete tops with locked cast iron manholes in place of the wooden ones over all the old springs.

Owasco inlet rises in Tompkins county and flows some sixteen or seventeen miles northerly to Owasco lake. It is a small creek and along its course are several small neighborhood communities and the villages of Croton, Locke and Moravia. Its waters are not used for domestic or power purposes and it probably serves as a drainage outlet of the southern portion of the watershed adjacent to Owasco lake. This lake is about eleven miles long and is the source of water supply of the city of Auburn. The village of Moravia has no sewage system. Cesspools are in general use, though there are some properties that have direct connection with the inlet.

The assessed valuation of the village of Moravia is $639,538 and its bonded debt, including the bonds issued for the purchase and improvement of the water supply system is $49,000. The waters of the springs proposed to be taken by the applicant are not available to other municipal corporations or civil divisions of the State, nor are these waters now used for any purpose whatever. They help form the head waters of the Dry creek, a tributary of the Owasco inlet. Included in the cost of the proposed new work is the sum of $500 for the purchase of the land upon which the springs are situate and for the diversion of the water from the land of the owner.

The State Water Supply Commission therefore determines:

First: That the plans proposed by the village of Moravia for an additional supply of water as herein modified are justified by public necessity.

Second: That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third: That the said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The State Water Supply Commission does hereby approve the maps and profiles of the lands to be taken by the village of Moravia for an additional source of water supply and does hereby approve the application and plan of the said village, with the modifications thereof, as hereinbefore set forth and which modifications it determines to be necessary to protect the water supply and interests of the applicant and the plan or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of the said lands and the execution of said plans.

In witness whereof, The State Water Supply Commission caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all plans, maps, surveys, and other papers relating thereto, filed in its office in the city of Albany, this 24th day of August, 1910.

[L. S.]

HENRY H. PERSONS,
President.
CHARLES DAVIS,
MILO M. ACKER,
JOHN A. SLEICHER,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 81.

Canajoharie. (Incorporated village.) Town of Canajoharie, Montgomery county.

Petition filed July 13, 1910.

Hearing held July 26, 1910.

Village had been furnished with water by the Canajoharie Water Supply Company, but supply has been inadequate and unsatisfactory. In June, 1909, the village applied to this Commission for permission to take water from Sprite creek, located about twelve miles northeasterly and at an elevation of about 700 feet above village. The creek is formed by springs and the supply of water is abundant and ideal for domestic use. The water is to be conducted through wood pipes to a reservoir located in the center of farm of Charles H. Groff with a capacity of five million gallons, and a large main will carry water to the distributing pipes.

The petition asked for approval of plan to change the location of the reservoir and pipe line, and involved the acquiring of lands not contemplated in previous application. Reservoir is to be located on the northeastern corner of the same farm, a more convenient and advantageous location, the creek being suitable and accessible for cleanout and overflow pipes. The change in the conduit line will necessitate a larger size of pipe, but 2,000 feet less than originally planned. There is also a saving in the cost of procuring the right of way and the construction cost.

Total estimated cost of project, $150,000.

The Commission approved the application August 10, 1910.

Decision filed August 11, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of THE TRUSTEES OF THE VILLAGE OF CANAJOHARIE, Montgomery County, N. Y., for the approval of a proposed amendment or modification of maps, plans and profiles of proposed water supply system, and the source thereof.

Decision.

Application filed: July 13, 1910.

Hearing: July 26, 1910.

Decision: August 10, 1910.

This is an application by the village of Canajoharie for approval of the following proposed modifications of its original plan to supply its inhabitants with water, viz.:

A change in location of the storage reservoir, a relocation of a part of the conduit line and a consequent and necessary increase in the size of the pipe line.

These modifications involve the acquiring of lands not contemplated by the original plan which was approved by the Commission on March 10, 1910.

The reservoir as originally located was situate very nearly in the center of the farm of Mr. Charles H. Groff, and within a short distance of his buildings. The new location is in the northeastern corner of his farm in a triangle formed by two highways and a creek, a much more convenient and advantageous location, the creek being suitable and accessible for cleanout and overflow pipes, and very much more satisfactory to Mr. Groff and more economical to the village.

The change in the conduit line being some 2,000 feet shorter than the original line and following the highway for upwards of three miles is for economy in the matter of right of way and construction cost, though the relocation of the reservoir and the conduit line as proposed necessitates an increase in the size of the pipe line.

No municipal or civil division of the State will be affected by the proposed changes other than those affected by the original plan.

Notice of the hearing was given in both the local papers of the village of Canajoharie pursuant to order of this Commission, and the village authorities caused a notice of the hearing to be mailed to each one of the property owners affected by this application.

No objections were made or filed to the application and no person appeared at the hearing in opposition.

This application should be granted.

DECISION.

The State Water Supply Commission therefore determines:

That the modification of the maps, plans and profiles herein proposed by the village of Canajoharie is justified by public necessity. Such modified plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply, and that such plans make fair and equitable provision for the determination and for the payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans.

The State Water Supply Commission does hereby approve the modified plans filed with it on July 13, 1910, and accompanied by a map of the lands to be acquired by the village of Canajoharie for a new or additional source of water supply and profiles thereof, showing sites and areas of the proposed reservoir and other works, the profile of the aqueduct line, and the flow lines of the waters when impounded, and plans, surveys and abstracts of official reports relating to the same.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same with all plans, maps, surveys and other papers relating thereto filed in its office in the city of Albany, this 10th day of August, 1910.

[L. S.]

HENRY H. PERSONS,
President.

ROBERT H. FULLER,
JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
Commissioners.

APPLICATION NO. 82.

YOUNGSTOWN. (Incorporated village.) Town of Porter, Niagara county.

Petition filed July 20, 1910.

Hearing held August 5, 1910.

Village has no public system and takes water from private wells. No fire protection.

The petition asked for approval of plan to take water from Niagara river, forty feet from shore. Pumping plant to consist of two power pumps, 15 H. P. gasolene engines, capacity of each 200 gallons a minute; equivalent to 288,000 gallons in 24 hours. Pressure of 100 pounds per square inch. Purification plant, a horizontal steel pressure filter, 200 gallons a minute. Water to be pumped to distributing mains and a standpipe of steel built on substantial stone or concrete foundation, 10 feet in diameter and 100 feet in height; situated in southeasterly corner of village. The distributing system of pipes consists of 8-inch, 6-inch and 4-inch cast iron pipes and 36 fire hydrants.

Population approximately 600.

Total estimated cost of proposed project, $23,000.

Commission approved the application August 24, 1910.

Decision filed August 26, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the VILLAGE OF YOUNGSTOWN for the approval of its maps and plans for a new and additional source of water supply and for the construction of a water works system.

Decision.

The application in these proceedings, accompanied by the maps, plans and specifications for a water works system, was filed with the Commission on the 20th day of July, 1910.

Notice for a hearing to be held thereon at the office of the village clerk, in the village of Youngstown, on the 5th day of August, 1910, at 10 o'clock in the forenoon of that day was given. Such notice was published as provided by law.

The matter came on for a hearing on the 5th day of August, 1910, at the time and place stated in the notice. The hearing was adjourned to Eldorado Hotel, Youngstown. The village appeared by its officers Mr. J. W. Falkner, president of the village, and gentlemen Miles G. Wellman and Ludwig Pierson, trustees of the village.

No objections to the application were filed with the Commission and there were no appearances in opposition thereto.

The village, by its representatives, filed proof of publication of the notice of hearing.

The proof given at the hearing shows that Youngstown, a village of 700 people, steadily, though not rapidly, increasing in population, is situate in Niagara county on the Niagara river and has an assessed valuation of $255,965.

By reason of its attractive surroundings and its proximity to the Niagara river, nonresidents, in yearly increasing numbers, spend some portion of the summer months there.

At the present time, water for domestic purposes is obtained wholly from wells sunk into the ground a distance of about 30 feet. It has no fire apparatus nor fire protection except such voluntary bucket service as may be quickly organized at times of fire. In the business section of the village, the insurance rate is $32.50 per year per $1,000.

The question of installing a water plant for this village was submitted to a vote of the people on the 28th day of October, 1909. The result of the vote was a majority in favor of establishing the water plant.

The village proposes to take its water from a point in the Niagara river about 20 feet out in the channel from the shore. Their plan is to purchase sufficient land and install a pumping station and filtration plant and pump the filtered water into a stand-pipe situate near the center of the village and high enough to give 45 pounds pressure. This stand-pipe, having a capacity of 60,000 gallons, is to be connected with the distribution system which carries the water to all parts of the village and includes a sufficient number of hydrants to give ample fire protection.

The plant as designed will cost about $23,000 and bonds have been issued in that amount.

It is the purpose of the village to use the money raised by these bonds to build and equip the plant and pay all damages that may accrue to persons or property, either direct or indirect, which will result from the acquiring of the necessary lands and the execution of said plans.

The proof also shows that the execution of the plans of the applicant herein will not in any manner interfere with any other municipality or civil division of the State or the inhabitants thereof, giving due consideration to their present and future necessities for sources of water supply.

It is well known that the Niagara river water, receiving as it does the sewage and waste from cities and villages farther up the stream, is not of a quality that commends itself for potable purposes. This objection, however, to taking water from Niagara river is overcome by the fact that the plans of the applicant provide for a steel pressure filtration plant with a capacity of 200 gallons per minute guaranteed by the manufacturers to do its work to the satisfaction of the village officers. It is now generally conceded that with proper filtration, the waters of Niagara river may be safely used for potable purposes.

The abundance of the flow of this stream is of itself evidence that the plans of the applicant will not in any manner affect any other municipalities or civil divisions of the State or the inhabitants thereof, particular consideration being given to the present and future necessities of sources of water supply.

The necessary permission for the applicant to take water from the Niagara river for the purpose of establishing this proposed plant has been obtained from the War Department of the United States Government. An investigation made by the engineer for the village shows that there is no other available source of water supply for this community.

The fact that this village, growing in population, and having no water system except wells which are liable to become contaminated, and receiving into its midst summer visitors in increasing numbers, is further evidence that the plans and specifications of the applicant are justified by public necessity and should receive the approval of this Commission.

The Commission, therefore, finds and determines:

FIRST: That the plans proposed by the applicant are justified by public necessity.

SECOND: That such plans are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That such plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

FOURTH: The Commission does hereby approve the maps and profiles for a water plant filed by the village of Youngstown with its application in these proceedings.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION has caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all the maps, plans, specifications, surveys and other papers relating thereto filed in its office in the city of Albany, this 24th day of August, 1910.

[L. S.]

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 83.

HORNELL. (Incorporated city.) Town of Hornell, Steuben county.

Petition filed August 4, 1910.

Hearing held August 17, 1910.

City has a water works system constructed in 1882, which has been enlarged and expanded. The supply is taken from Seeley creek and Grover river which drain a watershed of twelve square miles. A reservoir located on Seeley creek has a capacity of 46,000 gallons. Mechanical filters have been installed. A 16-inch cast iron pipe connects reservoir with filter and filters with distribution mains. City has been growing steadily and the capacity of the present reservoir is insufficient.

The petition asked for approval of plan to construct another reservoir on Seeley creek above present reservoir. To be formed by the construction of a dam and embankment across the valley of creek, and to have a capacity of 110,000,000 gallons. Reservoir to be filled during freshets and held in reserve for dry weather. 146 acres to be acquired. Plans also propose to lay a new eighteen-inch cast iron main from present reservoir to distribution system.

Analyses showed the water to be suitable for domestic use. Bacteria of the B. Coli type were not present.

Total cost of proposed improvement, $100,000.

The Commission approved the application August 24, 1910.

Decision filed August 26, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter

of

The Application of the CITY OF HORNELL by and through its Board of Public Works for permission to make extensions to its present water supply and for the approval of its maps and profiles.

Decision.

On the 4th day of August, 1910, the city of Hornell, by its Board of Public Works, filed its application for a new and additional source of water supply; for permission to extend its present water plant and for the approval of its maps and profiles therefor.

Accompanying this application was the report of its superintendent of public works and maps, plans and profiles, showing the lands to be acquired and the reservoir to be constructed.

A notice for hearing upon this application was given to be held at the City Hall in the city of Hornell on the 17th day of August, 1910. This notice was published as the law provides.

On the 17th day of August, 1910, the Commission met pursuant to such notice at the time and place therein stated. The city appeared by its attorney, Francis M. Cameron, and by the members of the Board of Public Works, to wit.: Charles G. Kelly, C. W. Etz, James E. Schwarzenbach and W. W. Babcock.

The city attorney filed a proof of the publication of the notice. An adjournment was then taken to the office of the Board of Public Works of said city, where the hearing was held and the testimony taken, after which the Commission inspected the site of the proposed reservoir and the lands proposed to be purchased.

The city of Hornell purchased its present water plant from a private company September 1, 1901, for $300,000.

In the nine years of city ownership those having charge of the plant have reduced the bonded indebtedness from $300,000 to $248,000, or $52,000. They have also extended the distribution mains and otherwise improved the plant at a cost of nearly $100,000, besides reducing the rate charged for water rentals 20 per cent.

The net yearly income of this plant, after deducting all charges for upkeep, extension, repairs and improvements, cost of operation and interest on the outstanding bonds, is from $12,000 to $15,000.

The city has a population of about 14,000 and is steadily growing. There is also a constant increase in the consumption of water. The reservoir of the present plant is situate nearly five miles from the city and at an elevation which gives a sufficient pressure for fire protection.

This reservoir is connected with the filter plant and the filter plant with the distribution mains in the city by a 16-inch cast-iron pipe. The city owns the lands surrounding the reservoir and also a strip of land on each side of Seeley creek, the stream running into the reservoir for a distance up the creek for nearly one mile. There are at present nearly three thousand consumers of water in the city besides 165 fire hydrants. During the past few years, on account of the size of the present reservoir, the superintendent has been compelled to, and has restricted the consumption of water in the city during the dry months of the year.

Included in the city's plant is a mechanical filter which has done its work well, as the proof shows during the past seven years and probably for many more that not a single case of typhoid fever has been traceable to the city water. The analysis of the sample of the water taken from the source of the proposed addition and filed with the application in these proceedings shows that the water is free from deleterious substance.

The plan of the Board of Public Works of the city of Hornell is to buy a farm of 146 acres situate upstream from the present reservoir and adjacent to the strip of land which the city now owns and lying on each side of Seeley creek, and build a new reservoir with a capacity of 110,000,000 gallons, fill it during the periods of freshets and hold it in reserve for dry weather; and also to lay a new 18-inch cast-iron main from the present reservoir to the city's distribution system to meet the demands of increasing consumption and also to increase the pressure for fire protection. Such an addition would provide an abundance of water for the city for many years to come and furnish a protection against a possible break in the present main. The income from the plant under the present rate of consumption will in a reasonable time pay the present bonded indebtedness and the cost of the proposed improvement. There is every reason to believe, however, that with the growth of the city, the consumption of water will increase and that there will be a relative increase in the net earnings of the plant.

The estimated total cost of these improvements is $100,000. It is clear from the above facts that such improvements will add no addition to the city's tax levy. Even if it should a city with 14,000 people and an assessed valuation of five and a half millions dollars could not afford to hesitate in perfecting and improving its water supply under the conditions, which the proof and an inspection of the present plant shows existed in this city.

In purchasing so large a tract of land to surround the proposed reservoir, the Board of Public Works of the city of Hornell has certainly put itself in line with the progressive and scientific improvement and care of municipal water plants and municipal watersheds. The soil of the farm proposed to be purchased is so well adapted for the growing of pine trees that the plan of the authorities to follow up their work of building a new reservoir and laying a new main to the city by reforesting this farm which will surround the reservoir, will not only add to the sanitary condition of their watershed, but will provide a forest growth which will in a few years be another source of profit to the city.

The value of an abundance of pure water to the health and prosperity of the city is so evident, that the Commission cannot do less than commend the Board of Public Works of Hornell in taking early action to increase and improve the city's water supply.

The plans for such increase and improvements have been examined by our engineer who finds them in all respects complete and satisfactory.

The proof shows that taking water from this new source and making the improvements and the additions set forth in the application will not in any manner affect any other municipality or civil division of the State or the inhabitants thereof, particular consideration being given to the present and future necessities for sources of water supply.

The city proposes to issue bonds to the amount of $100,000 and with the proceeds received from the sale thereof to pay for the purchase price of the land to be taken, build the proposed reservoir and to pay any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or from the acquiring of said lands.

In view of all of the conditions shown by the proof upon the hearing to exist in the city of Hornell, and after an inspection of the present water plant and proposed improvements and an examination of the plans and specifications therefor, the Commission is of the opinion that the application of the city of Hornell is to be justified by public necessity and should receive its approval.

The Commission, therefore, finds and determines:

First. That the plans proposed by the applicant are justified by public necessity.

SECOND. That such plans are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD. That such plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

FOURTH. The Commission does hereby approve the maps and profiles for a new and additional source of water supply for the city of Hornell, and for the improvement and enlargement of its present plant, which maps and profiles were filed with the application in these proceedings.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION has caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all the maps, plans, specifications, surveys and other papers relating thereto, filed in its office in the city of Albany, this 24th day of August, 1910.

[L. S.]

HENRY H. PERSONS,
President.

MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
JOHN A. SLEICHER,
Commissioners.

APPLICATION NO. 84.

SILVER SPRINGS. (Incorporated village.) Town of Gainesville, Wyoming county.

Petition filed August 12, 1910.

Hearings held August 25, September 23 and October 11, 1910.

Village is supplied with water by Castile Water Company from springs, but the supply during the dry season has been insufficient. In 1904 the village installed its own system at a cost of about $25,000 but upon completion of the work it was found that the supply was inadequate. The springs which appeared to be large and constantly flowing proved to be only surface water which drained into a basin and formed a swamp. The system installed consisted of a circular concrete reservoir, 200 feet above main street, 50 feet in diameter, 12 feet deep, completely covered with a concrete roof and with a capacity of 400,000 gallons. A pipe connects this with the distributing mains, fire hydrants, etc.

The petition asked for approval of plan to sink deep wells, erect a pumping plant and pump directly into distribution mains and from there to reservoir. A pressure of 85 pounds for fire protection. The wells will be sunk to a depth of from 150 to 170 feet.

Water is clear and abundant, but rather hard.
Total cost of proposed project, $14,000.
Population estimated at 1,000.
The Commission approved the application November 3, 1910.
Decision filed November 5, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Village of Silver Springs for a new and additional source of water supply.
Decision.

Silver Springs, a village with a population of nearly 1,000 people, situate in Wyoming county, comes to this Commission and asks it to approve of maps, plans and profiles for a new and additional source of water supply.

At the present time the village of Silver Springs is supplied with water by the Castile Water Company. This water company takes its water supply from a spring situate at an elevation of 1,585.75 feet, on the lands of the Buffalo, Rochester and Pittsburg Railroad Company, about one mile distant from the business portion of said village and from a spring situate at an elevation of 1,550.4 feet, on lands owned by the water company, near the line of said railroad company and about three-fourths of a mile from the business center of said village.

The water from both of these springs is collected and turned by gravity into a collecting tank located on land owned by the water company, at an elevation of 1,532.20 feet, and from there conveyed through wooden pipes, by gravity, to a wooden tank with a capacity of 65,000 gallons, situate at an elevation of 1,508.7 feet, about one-half mile distant from the business center of the village. The elevation of the Erie station, near the business center of the village, is 1,395 feet. The difference between the elevation of the distribution tank of the water company and the elevation of the business center of the village is about 113.70 feet, which, under normal conditions, will give a water pressure at the Erie station or business portion of the village of 48 pounds per square inch, or thereabouts. This pressure, under normal conditions, with 300 feet of standard hose with a 1¼-inch nozzle will throw a stream of water to the height of 42 feet. Such a pressure is sufficient to furnish ample fire protection to that part of the village of Silver Springs which does not lie at a greater elevation than the Erie station if the supply from the water company's source is large enough to furnish the necessary water. Three ordinary hose of standard make with 1¼-inch nozzle, under a pressure of 47 pounds, will throw 440 gallons of water per minute. The distribution tank of the water company, with a capacity of only 65,000 gallons, with an inflow of 70 gallons per minute from the two springs, would supply water for fire protection for two and one-fourth hours, assuming that the tank is full at the time the three fire streams are turned on. It is very clear that such a supply could not be considered sufficient for fire protection for that portion of the village which lies at an elevation considerably above the Erie station.

A few years ago, and before the creation of the State Water Supply Commission, the village of Silver Springs laid out and constructed a new municipal plant at an expense of approximately $25,000. The source of this supply was from what the people thought were large and constantly flowing springs, coming to the surface over a large area. The water was piped into a concrete reservoir with a capacity of 400,000 gallons, situate at an elevation of 1,571.74 feet, and from there distributed throughout the village in pipes belonging to it. These springs, which gave superficial evidence of furnishing such an abundance of water, turned out to be only the surface water which drained into a basin and formed a swamp because there was no sufficient outlet. As soon as the swamp or surface water was drained off, the village was without water. Confronted with such a condition, the village authorities began negotiations with the Castile Water Company to supply them with water. These negotiations resulted in a contract by which the village has been supplied with water by said company. The conditions existing under this water agreement have not been at all satisfactory to water consumers. The supply during the dry season of dry years has been so low that it was impossible for many users to obtain water for domestic purposes during portions of the day. The pressure for fire protection during such time has been entirely inadequate. Such a condition makes it the plain duty of those in authority to provide a sufficient and constant supply of water for both domestic consumption and fire protection to this village.

The village comes to us with a plan which contemplates sinking deep wells and erecting a pumping station and pumping the water from these wells into the present distribution system of the village. The concrete reservoir, situate at an elevation of 1,571.74 with a capacity of 400,000 gallons, connected as it is with pipes throughout the village, is adequate for the needs of the village, providing water can be turned into it in sufficient quantity. There are deep wells which are furnishing an almost inexhaustible amount of water, so far as the needs of this village are concerned, situate in the locality near where the village proposes to sink new ones. With these deep wells and a pumping station the village authorities say that they will have an adequate supply of pure and wholesome water for all municipal purposes.

The village taxpayers, in the manner provided by statute, have voted to install the well and pumping system prayed for in the petition of the village officers.

Were it not for the objections of the Castile Water Company the work of the Commission in this matter would be comparatively simple. This company comes before us and says that they have been to a large expense and also surrendered valuable rights which they had for furnishing water to customers in Castile in order to bring to this village water when it was in need and that they ought not now to be ruined indirectly by the village establishing a new municipal plant which will result in driving them out of business entirely. There is much force to the position of the objectors aside from the fact that care should always be taken not to destroy property.

Taking the water from deep wells, as proposed, cannot interfere with any other municipality, and the plans of the village make adequate provision for the payment of any and all damages, either direct or indirect, that may be caused by installing this proposed municipal system.

The State Water Supply Commission, therefore, finds and determines:

First: That the plans of the applicant for a new source of municipal water supply are justified by public necessity.

Second: That the plans of the applicant for a new municipal source of water supply are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves of the plans of the applicant for a new source of water supply.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all maps, plans, surveys and other papers relating thereto, filed in its office in the city of Albany, this 3d day of November, 1910.

[L. S.]

HENRY H. PERSONS,
President.

JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 85.

Ithaca. (Incorporated city.) Town of Ithaca, Tompkins county.

Petition filed August 22, 1910.

Hearing held September 20, 1910.

City has a water works system and takes water from Six Mile creek. Three reservoirs each with a capacity of 2,000,000 gallons; a steam pumping plant with water power part of year and a mechanical filtration plant comprise the system. The water is collected in a basin on the creek behind a masonry dam and pumped from there into reservoirs. Storage capacity is too small for safety.

The petition asked for approval of plan to build another reservoir 5,000 feet up stream from present dam, across channel of the creek. A new intake will be constructed above new dam at an elevation high enough to deliver water to filtration plant by gravity instead of by pumping. Capacity of reservoir will be 375,000,000gallons and will cover 74 acres. New dam will be about 100 feet long and 70 feet high, built of concrete. A conduit 24 inches in diameter will be laid from new dam to filter plant, a distance of 9,500 feet.

Population, 16,000, with a student population of 4,000.

35 acres of land to be acquired.

Analyses showed the water to be very good.

Total estimated cost of project, $150,000.

The Commission approved the application October 7, 1910.

Decision filed October 13, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the CITY OF ITHACA.
} *Decision.*

The city of Ithaca by its petition filed with this Commission August 22, 1910, prays for an order approving its maps, profiles and plans as presented for a proposed additional storage and elevating of the intake for its water supply. The present water supply of the city is obtained from Six Mile creek, the intake being about a mile south of the city limits. The water is pumped from the intake and reservoir dam which contains about ten million cubic feet with a lift varying from forty to fifty feet to the filtration plant. The pumping of the water is done by steam. From the filtration plant the water is distributed to the major portion of the city by gravity. To the higher levels of the city the water is raised by pumping — by water power part of the year when there is a sufficient surplus of water in Six Mile creek — but usually during the summer months and part of the winter months by steam to two high-level systems. There is a third system, a comparatively small amount of water being obtained from artesian wells and pumped by steam to a pressure zone in the western part of the city. There are now five pressure zones. The first and largest, known as the South Hill system, distributes water to the flat or major portion of the city by gravity, at practically sixty pounds pressure. The second zone takes its supply from the clear water basin at the filtration plant that supplies the lower part of the South Hill section of the city and at times is used as a means of raising the pressure for fire on the flats; pressure from this system is about eighty pounds to the square inch. The third zone is from the artesian wells, the pressure at the pumping station being about 120 pounds. The fourth and fifth zones are on East Hill, both being supplied by the same set of pumps at the Vandalia pumping station. The water is raised to the same pressure in both, but for the lower of these two zones, or what is known as the middle-pressure zone it is reduced so as to admit it to the East Hill steel tank, from which it is distributed by gravity. On the higher of these zones the water is under direct pressure from the pumps, the high-pressure zones furnishing supply to that part of the city in the vicinity of Cornell University. It is evident that it is practically impossible to supply all portions of the city of Ithaca with water under uniform pressure by reason of its location and the varying elevations within the city limits, but from a study of the situation and from the testimony produced upon the public hearing, held September 20th last, it is clearly evident that more than three pressure zones are unnecessary. The present water supply and distribution system was installed by the Ithaca Water Works Company and taken over by the city under condemnation proceedings about six years ago. A witness described the plant as "Old and pretty well worn out."

The permanent population of the city of Ithaca is now over 16,000. This number is increased from 4,000 to 5,000 by the student population at Cornell University for nine or ten months in the year. The total demand upon the system is estimated at about 1,600,000 gallons per day, only a small part being metered and very little used for power purposes, and while the quantity of the supply is apparently sufficient and the quality acceptable, yet this result is obtained at great expense. As the system stands to-day it has cost the city approximately $943,000. The cost of maintenance and operation for 1909 was $31,186, and the interest charges for the same period $44,476, a total of $75,962. The revenue was $65,000, which included $9,000 paid by the city to the water department for hydrant service, so that the plant was operated at a loss of about $20,000. That this condition of affairs is of great public concern to the city of Ithaca is apparent, and the Board of Public Works is justified from the mere statement of the facts in making the exhaustive investigations which have been made by them under the direction of competent engineers to remedy this loss and to improve the system. Investigations and studies have been made of the surrounding country for possible sources of available water supply for the city. Cayuga lake, artesian wells, various creeks flowing into Cayuga lake, Tanghonock creek, Infield creek, Cayuta lake, Spencer lake, Dryden lake and Fall creek, have all been thoroughly examined, and after consideration of each of these available sources of supply, the cost of installation and with due regard for the present indebtedness of the city for its water system, the Board of Public Works now proposes to build a masonry or concrete dam about 55 feet in height with a spillway length of about 100 feet across the channel of Six Mile creek about 5,000 feet upstream from the present dam. It also proposes to construct a new intake above the new dam at an elevation high enough to deliver the water to the filtration plant by gravity instead of by pumping as is now done; to impound some additional water in the new reservoir; to furnish power for pumping to the higher levels in the city; to construct from the proposed dam to the present filtration plant a 24-inch cast-iron pipe line of about 9,000 feet in length and to purchase rights of way and about 35 acres of land for the reservoir site. The storage capacity of the new reservoir will be 375,000,000 gallons, of which about 30,000,000 gallons can never be drawn off, as it will be held below the level of the intake. This gives a net storage of 336,000,000 gallons when allowance is made for evaporation and possible leakage. The plans of this work are well designed and are acceptable. The preliminary estimated cost of the entire work is placed at about $150,000. The testimony taken on the hearing shows that the expense of operation of the plant will be largely cut down by substituting the force of gravity in delivering the raw water to the filters instead of lifting it by burning coal and in furnishing water power to lift the water to the higher levels of the distribution system; that with the new system established there will be furnished greater opportunity for increasing facilities for fighting fires, that more water and more power will be had for the uses of the city, and that there will be a saving in expense in operation over and above the additional interest charges caused by the construction of the new system, and that this saving will increase as the demand for the water increases. For these reasons it is clear to this Commission that the plans of the city of Ithaca are justified by public necessity.

The plans proposed do not affect other municipalities and civil divisions of the State, nor the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

The Six Mile creek, from which the present and proposed source of supply is taken, has its sources in various hills to the southeast of the city of Ithaca and also springs in the basin of the valley in the vicinity of Slaterville. It head waters are in the town of Dryden, in the county of Tompkins, from thence it flows northwesterly and empties into Cayuga inlet, having a total length of from 14 to 15 miles; its waters are not now used for any purpose, except by the city of Ithaca. Below the city and down to the outlet in Cayuga inlet there are no villages and no use of its waters is made for any purpose, and there are no instances where the construction of the proposed work, or the acquisition of the proposed lands, or the diversion of the water from Six Mile creek will, directly or indirectly, damage any person below the present intake, the Ithaca Water Works Company having made compensation for rights below the present intake and the city having acquired such rights from that company.

The State Water Supply Commission, therefore, finds and determines:

FIRST: That the plans of the applicant are justified by public necessity.

SECOND: That the plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves of the plans of the applicant.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto, and the same, with all maps, plans, surveys and other papers relating thereto filed in its office in the city of Albany this 7th day of October, 1910.

[L. S.]

HENRY H. PERSONS,
President.

MILO M. ACKER,
CHARLES DAVIS,
JOHN A. SLEICHER,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 86.

ROSLYN. Water District, Town of North Hempstead, Nassau county.

Petition filed October 19, 1910.

Hearing held October 25, 1910.

The population of the water district has been obtaining a supply of water from individual wells, springs and cisterns.

The petition asked for approval of plan to drill or dig wells and springs on property of Isaac Hicks situated near head of Hempstead harbor. Water is to be pumped to a standpipe with a capacity of 140,000 gallons, the top elevation of which is to be 340 feet above sea level and 250 to 280 feet above main street. Plans indicate a well designed distribution system. Pumps to have a working capacity of 1,152,000 gallons daily.

Two acres of land to be acquired.

Total cost of proposed project, $108,000.

The Commission approved the application October 25, 1910.

Decision filed same date.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the WATER COMMISSIONERS OF THE ROSLYN WATER DISTRICT, of the town of North Hempstead, county of Nassau, State of New York, for the approval of its maps and plans for a new water supply.
} *Decision.*

The petitioners, the Board of Water Commissioners of the Roslyn Water District, created in the town of North Hempstead, county of Nassau, State of New York, on August 30, 1910, by the town board of the town of North Hempstead, upon a petition of a majority of the owners of property within the said district, did upon the 19th day of October, 1910, file with the State Water Supply Commission a petition duly executed and verified by John F. Remsen, Ralph Tubby and Thomas Fagan, the members of said board, said petition praying for approval of the Water Commissioners' plans for a new system of water supply.

The petition and accompanying exhibits having been filed as required by and in accordance with the statute and the prescribed rules and regulations, the Commission caused public notice to be given that a public hearing would be held at the Honorable C. E. Remsen's court room in the village of Roslyn, town of Hempstead, county of Nassau, State of New York, at 10 A. M., Tuesday, October 25, 1910, at which hearing the petitioners and all persons duly filing objections to the application, pursuant to statute, would be permitted to present evidence in substantiation of their respective claims.

At the public hearing, Hon. John F. Remsen, chairman of the Water Commissioners, appeared and gave evidence in favor of granting the application, which evidence was substantiated and supplemented by that of Mr. Walter E. Sexton, engineer for the water district.

The petition and the evidence adduced at the hearing show that there is no adequate system of water supply for domestic purposes and fire protection within the district, and that the plans proposed, approval of which is asked, will provide such an adequate system.

The petition and evidence also show that no other municipal corporation or civil division of the State, or the inhabitants thereof will be affected by the plans of the petitioners, and that no indirect damages will result from the execution of the plans or the acquisition of the lands, and as to the direct damages that may result, a just and equitable plan to determine and provide for the payment of the same has been devised, said plan being to purchase required lands if practicable, and if not to acquire the same by condemnation and due process of law.

The only objections to the granting of the application were (1) with reference to deficiencies in the petition, and (2) to the amount of land to be acquired. Sufficient supplementary data has been filed with the Commission to meet the first objection, and the Commission believes that the amount of land to be acquired, namely, two acres, is a reasonable amount to meet the requirements, and the second objection is, therefore, not sustained.

This Commission, therefore, finds and determines:

FIRST: That the plans proposed by the Roslyn Water District are justified by public necessity.

SECOND: That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission does, therefore, approve the plans submitted and grant the application of the petitioner.

[L. S.] IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same, with all plans, maps and other documents relating thereto, filed in its office in the city of Albany, this 25th day of October, 1910.

HENRY H. PERSONS,
President.
CHARLES DAVIS,
JOHN A. SLEICHER,
State Water Supply Commission, State of New York.

APPLICATION NO. 87.

Cherry Creek. (Incorporated village.) Town of Cherry Creek, Chautauqua county.

Petition filed September 5, 1910.

Hearing held September 24, 1910.

Village has no public system of water supply and the people depend upon dug or driven wells. For fire protection there is one hand fire engine which takes water from the stream passing through the village, or from two cisterns.

The petition asked for approval of plan to take water from a stream in the hills, two and one-half miles from village into which the water from a series of springs will be gathered. From a collecting basin on the stream the water will be piped through an 8-inch main to a reservoir 150 feet above business center. It will have a capacity of 200,000 gallons and maintain a constant pressure of about 75 pounds.

The analyses showed the water to be of good quality, but there was a high bacterial count and also the presence of the B. Coli type. To guard against contamination of the water, the plans propose the purchase of ten acres of land around the springs. Proposed supply gauges 40,000 gallons daily to serve a population of over 500. Thirty-six fire hydrants.

Total estimated cost of project, $30,000.

The Commission approved the application October 7, 1910.

Decision filed October 11, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Village of Cherry Creek for approval of its maps, plans and profiles for a new source of water supply and the establishment of a municipal water plant.
} *Decision.*

Cherry Creek, a village of 500 people, situate in Chautauqua county, by its application signed by Emory Kent, the president of said village, and M. H. Butler and E. G. Hubbard, trustees, acting as its water board, and filed on the 6th day of September, 1910, asks for permission to install a new municipal water plant.

The petition shows:

First: That the village of Cherry Creek was incorporated on the 17th day of June, 1893.

SECOND: That on the 15th day of March, 1910, a majority of the duly qualified electors voted to establish a municipal water plant at an expense not to exceed $25,000 and to issue the bonds of the village therefor.

THIRD: That the board of village trustees, constituting the water board of said village, did on the 28th day of May, 1910, vote to cause a survey to be made to determine the cost of such a municipal water system and to issue the bonds of the village to obtain the money to pay for the cost of the same.

FOURTH: That such survey and estimates showed that it would cost an additional $5,000 to properly construct said municipal water system.

FIFTH: On the 11th day of August, 1910, said village board voted to call a special election to be held on the 23d day of August, 1910, to vote upon the proposition of raising $5,000 additional upon the bonds of said village in order to pay for the cost of said municipal water plant.

SIXTH: That on the 23d day of August, 1910, the duly qualified electors of said village, by majority thereof, voted to raise an additional sum of $5,000 for the purpose of establishing said water plant.

SEVENTH: The petition also shows that there is no water supply in said village, except ordinary driven and dug wells and two tanks which are used for fire protection and that the village is without any adequate fire protection at all.

EIGHTH: The petition is also accompanied by maps and plans for the proposed municipal water plant.

The evidence given on the hearing had on the 24th day of September, 1910, at the office of the village clerk establishes all of the allegations in the petition above mentioned. The testimony further shows that the assessed valuation of the village is about $210,000, only $7,750 of such assessed valuation being an assessment of personal property and that the village has no bonded indebtedness whatever. The school district of which Cherry Creek is a part is bonded for something like $5,700.

At the present time the village depends for fire protection upon a hand fire engine which it connects with water tanks sunk in the ground and with the creek running through the village. The proof shows that this method of fighting fires is wholly inadequate and that it is almost impossible to successfully cope with fire when it breaks out in the village. Nearly all of Main street at different times in the past 15 years has been burned, a greater part of which has been rebuilt from time to time. Nearly all of the buildings in the village, including business places, are of wood. On account of the inadequate fire protection the insurance rates are unusually high in the village. The tax rate in the village is only about 1 per cent. of the assessed valuation. There are in the village the usual number of business places, banks, newspapers, churches and stores, a canning factory and a maufacturing company which manufactures dairy supplies. The village proposes to take its water from a series of springs situate about two and one-half miles from the village and at an elevation which gives them a sufficient pressure for an adequate fire protection. The plan is to buy the ground surrounding the spring, fence it off and remove from the enclosure, which is to be a strip 100 feet wide and 400 feet long, all deleterious and decaying substances and to protect the springs from any possible pollution whatever and then convey the water direct from the springs in a 6-inch closed pipe to a distribution reservoir with a capacity of 225,000 gallons and at an elevation of 150 feet above the village about 2 miles distant therefrom, and then conduct the water from the reservoir to the village through an 8-inch main and then through a distribution system to all parts of the village and to locate 36 fire hydrants which will protect nearly all of the houses in the village. The reservoir will give approximately 70 pounds water pressure.

The springs are so situated that when the ground surrounding them is properly cleared and a suitable fence to protect them from contamination, there will be no houses within a mile of the springs; when so protected there need be no fear of pollution.

The examination by the Commission of the springs and the territory surrounding them leads the Commission to agree with the testimony of the witnesses as to the purity of the source of springs. The Commission is not unmindful of the fact that the analysis of the water taken from the springs which the applicant proposes to acquire shows that there was found bacteria of the bacilli coli communis type in the samples taken. This is accounted for by the fact that animals, pasturing in the fields where the springs are located, were allowed to communicate with the springs and made the land from which the water was taken a place for feeding, drinking and resting during the hot weather. When all of the decaying substances have been removed from in and about the springs and the water is taken directly from the springs before it runs over any low and swampy ground at all, it will be freed from all contamination. The location of the springs are such that taking water from them for this proposed municipal supply will not in any manner interfere with any other municipality or civil division of the State, taking into consideration their present and future necessities for sources of water supply.

The plan of the village to issue its bonds and with the proceeds thereof to pay all damages that may be caused by establishing this water plant, both direct and indirect, is fair and equitable. The fact that the village is without any adequate water protection and that it is composed largely of wooden buildings and has to pay an exceedingly high rate of insurance, it is clear to the Commission that the plans of the village are justified by public necessity.

The State Water Supply Commission, therefore, finds and determines:

First: That the plans of the applicant for a new source of municipal water supply are justified by public necessity.

Second: That the plans of the applicant for a new municipal source of water supply are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves of the plans of the applicant for a new source of water supply.

IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same with all maps, plans, surveys and other papers relating thereto, filed in its office in the city of Albany, this 7th day of October, 1910.

[L. S.]

HENRY H. PERSONS,
President.
MILO M. ACKER,
JOHN A. SLEICHER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 88.

ANDES. Water Co. (Incorporated.) Town of Andes, Delaware county.

Petition filed September 12, 1910.

Hearing held September 30, 1910.

The Water company has been furnishing water to the village of Andes since 1876 and has taken its supply from a spring gauging 64,000 gallons daily which has given an insufficient supply during the past two summers. The system consists of a masonry reservoir 48 feet square, 8 feet deep inside, of 140,000 gallons capacity, located near the spring and connected with the distributing mains by a six-inch cast iron pipe. There are sufficient fire hydrants to protect all parts of village.

The petition asked for approval of plan to take water from two springs on lands of Ira Worden and D. H. Murray, about 2,500 feet northeast of reservoir. Plans propose surrounding each spring with a basin four feet square and three feet deep and lead water therefrom to reservoir through 3-inch and 4-inch pipes. Springs will furnish an additional supply of 80,000 gallons daily.

Analyses showed the water to be well fitted for drinking and household use.

Total estimated cost of project, $3,500.

Water rates, $10 a year per family. No meters.

The Commission approved the application October 7, 1910.

Decision filed October 11, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the Andes Water Company for leave to procure and take an additional source of water supply.
} *Decision.*

The applicant is a private water company organized in 1875, with a capital stock of $6,000.

It is engaged in furnishing water for domestic use and fire protection to the village of Andes and has been since 1876.

Its plant consists of a concrete reservoir with a capacity of 140,000 gallons, situate at an elevation of 100 feet above the main street in the village of Andes. This reservoir is connected with two springs which furnish about 64,000 gallons of water in each 24 hours. From the reservoir there runs a 6-inch cast iron main conducting the water from the reservoir to the distribution pipes in the village. There is also installed as a part of this water system, a sufficient number of fire hydrants to protect all parts of the village.

The customers of the company are permitted to use water *ad libitum.* Up to about two years ago, the company's water supply was sufficient for all of the wants of the village. Since that time and during the dry months of the year, both summer and winter, there has been a shortage of water and to such an extent that the supply for fire protection has been inadequate and the village left without water for fire protection for days at a time. Such a condition ought not to exist at all, not even for a day. The dangers of a conflagration in the village of Andes are too great to be without ample fire protection at all times.

The proof given at the hearing shows that the company is financially able to make the additions asked for and the proof also shows that there is a public necessity for an increase in the applicant's water supply.

The proof given upon the hearing clearly shows that if the company is permitted to make such improvements by acquiring additional springs, it will be able to keep its reservoir full of water all of the time, which will give constant fire protection for the whole village even though the company's consumers are permitted to use water at their pleasure. It is a great satisfaction to water consumers to be permitted to use all the water they want and not be limited by meter measurements.

The springs proposed to be taken will furnish an additional supply of about 80,000 gallons of water per each twenty-four hours and are so situate that they cannot be used as a municipal water supply by any other municipality or civil division of the State, consideration being had for their present and future necessities for sources of water supply.

The conditions of the water supply of this company as shown to exist in the village of Andes, makes it clear that the plans of the applicant are justified by public necessity.

The Commission is satisfied from the plan of the applicant and from a personal inspection of the conditions upon the ground that the improvement asked for by the Andes Water Company, if made, will afford to the village of Andes an adequate water supply for both domestic purposes and fire protection for a long time. The plan of the company is to issue $3,500 of additional stock and with the proceeds thereof buy the proposed springs and the right of way to conduct the water, which can be collected therein, to the present reservoir and also to pay any and all damages, both direct and indirect, which will result from the execution of its plans.

The Commission, therefore, finds and determines:

FIRST: That the plans proposed by the Andes Water Company are justified by public necessity.

SECOND: That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves of the plans of the applicant for a new and additional source of water supply.

[L. S.] IN WITNESS WHEREOF, The STATE WATER SUPPLY COMMISSION hath caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same with all plans, maps, surveys and other papers relating thereto, filed in its office in the city of Albany, this 7th day of October, 1910.

HENRY H. PERSONS,
President.
MILO M. ACKER,
CHARLES DAVIS,
JOHN A. SLEICHER,
ROBERT H. FULLER,
Commissioners.

APPLICATION NO. 89.

ORISKANY FALLS. (Incorporated village.) Town of Augusta, Oneida county.

Petition filed October 11, 1910.

Hearing held October 21, 1910.

Village has no public system, but several residents have water piped into their premises from springs near village. Main supply is from dug wells. For fire protection the village has a hand pumping engine which can be used in the vicinity of Oriskany creek. There are also two standing fire pumps in private mills.

The petition asked for approval of plan to take water from a series of springs gauging from 130,000 to 145,000 gallons daily about two miles south of village and at sufficient elevation to deliver water to all points within village. Plans include the construction of a reservoir near springs by building a concrete dam fifteen to twenty feet in height and ninety feet long which will hold 13,000,000 gallons. Main conduit from reservoir to distributing mains will be 12-inch reducing to 10-inch at village line. A dyke to be constructed on west side to divert surface draining and prevent pollution. Pressure varies from 40 pounds to 70 pounds per square inch in thirty-seven hydrants.

Population, 822.

Water rates proposed are 60 cents 1,000 gallons for first 10,000 gallons, 48 cents 1,000 gallons for second 10,000 gallons, 36 cents for third, 30 cents for fourth and 24 cents for fifth. Meters to be installed on all service taps.

Analyses showed the water to be very good; unusually free from organic contamination; evidence of presence of B. Coli Communis.

Total estimated cost of project, $30,000.

The Commission approved the application November 3, 1910.

Decision filed November 25, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of
The Application of the VILLAGE OF ORISKANY FALLS for approval of its plans for developing a new source of water supply.
} *Decision.*

The petition in the aforesaid matter was duly filed with the State Water Supply Commission at its office in the Lyon Block, Albany, N. Y., on the 11th day of October, 1910. Thereafter, the Commission caused due notice to be given that a public hearing would be conducted on Friday, October 21, 1910, at 10 a. m., in the Engine House, in the village of Oriskany Falls, Oneida county, N. Y.

Previous to the date of the hearing objections to the granting of the application were duly filed in the office of the Commission by Thomas Gallagher and Charles Lovejoy.

On the appointed day the Commission did conduct the public hearing, previous to which, two of the Commissioners personally inspected the proposed source of supply. At the public hearing Messrs. Gallagher and Lovejoy appeared in person in substantiation of objections filed by them. It appeared that their objections related to the adjustment of the price to be paid for right of way, and the Commission ruled that the question of the amount to be paid was not within the jurisdiction of the Commission and that the interested objectors would be properly protected under the Code of Civil Procedure.

The village of Oriskany Falls, Oneida county, N. Y., was incorporated March 20, 1888, under due proceedings then had and taken under the then existing laws and statutes of the State of New York, and said village is now an existing legally constituted municipal corporation.

At a special election held on September 6, 1910, the proposition of issuing bonds in the amount of $30,000 to carry out the project proposed by the petitioner was submitted to vote; the result being 83 votes in favor — 28 votes opposed and one ballot declared void.

The population according to the last official census returns was 822. The unofficial returns for 1910 census indicate a population of 1,005. The population is gradually increasing. Including bank assessments there is over $300,000 assessed valuation within the corporation limits, the assessed valuation of real property being $207,200 and personal property $58,500. The village has no existing or outstanding indebtedness except for current obligations for which funds are available. The petitioner is, therefore, financially able to carry out the proposed project.

There is no existing public water supply system and the private supplies are inadequate and unsatisfactory for domestic purposes. There is practically no effective fire protection for any of the village except the portions immediately adjacent to the Oriskany creek, which are at present protected by means of fire pumps in the knitting mills. The nearest villages are Madison, two miles away, with a population of about 200 and which is located at a higher elevation than Oriskany Falls; and Waterville, which is four miles away and which has a water system.

The investigations of available sources of supply have indicated that the supply known as the Creamery Springs, is the only one which is available and adequate at a reasonable cost. The flow from these springs, in the early summer of 1910, measured from 133,000 to 145,000 gallons per day.

The village proposes to collect and impound the flow from these springs by means of a concrete dam fourteen feet high, ninety feet long, two feet thick at top and ten feet thick at base. The surface area of the proposed reservoir would be about 3.28 acres and the dam would impound about thirteen million gallons of water. A dike is to be constructed on the west side of the reservoir to divert the surface drainage and prevent pollution from that source. The piping system from the reservoir to the streets is entirely adequate to distribute the full supply in a satisfactory manner and to furnish a pressure varying from forty to seventy pounds per square inch. There are no pipes smaller than six inches in diameter. The plan provides for thirty-seven hydrants not more than 500 feet apart so that no house within the village will be more than 300 feet from a hydrant. The estimated cost of the work is $26,000 while an expenditure of $30,000 has been authorized. The plan of the village contemplates the use of meters in order to conserve the supply as much as possible. With this arrangement, the available supply will be sufficient to supply the needs of the village for a number of years.

The State Water Supply Commission, therefore, finds and determines:

FIRST: That the plans of the applicant are justified by public necessity.

SECOND: That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

THIRD: That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquisition of said lands.

The plans of the petitioner are, therefore, approved and the application granted.

[L. S.] In witness whereof, the State Water Supply Commission has caused this determination and approval to be signed by the Commission and caused its official seal to be affixed hereto and the same with all maps, plans, surveys and other papers relating thereto, filed in its office, in the city of Albany, this 3rd day of November, 1910.

HENRY H. PERSONS,
President.
JOHN A. SLEICHER,
CHARLES DAVIS,
MILO M. ACKER,
ROBERT H. FULLER,
State Water Supply Commission.

APPLICATION NO. 90.

Summerville. Water District, Town of Irondequoit, Monroe county.

Petition of Commissioners of water district filed October 20, 1910.

Petition was not properly verified and was returned to petitioner's attorney for proper verification, subsequent to which time notice was given the Commission that the petitioners desired to withdraw their petition.

APPLICATION NO. 91.

John A. Drew. Towns of White Plains and Greenburg, Westchester county.

Petition filed October 28, 1910.

Hearings held November 3, November 15 and December 2, 1910. The petitioner is a private individual seeking to supply the towns of Greenburg and White Plains with a water supply.

The petition asked for approval of plan to drive eight or more artesian wells, with a diameter six inches and a depth of from 85 to 100 feet, covering a territory of five and one-half acres. Amount of proposed supply, 1,000,000 to 3,000,000 gallons daily to serve a population of about 18,000. A pumping plant near the wells, capable of delivering 3,000,000 gallons daily directly into distributing system.

Water is free from pollution; absence of bacteria of B. Coli type.

The Commission approved the application December 29, 1910.

Decision filed January 10, 1911.

STATE WATER SUPPLY COMMISSION.

In the Matter of The Application of JOHN A. DREW for the right to engage in supplying water to the inhabitants of a portion of the Town of Greenburg and the Town of White Plains, Westchester county, N. Y.	*Decision.*

Application filed October 28, 1910.

Hearing at the Village of White Plains, November 3, November 15 and December 2, 1910.

Decision December 29, 1910.

Messrs. Battle and Marshall (George G. Battle, Esq. of Counsel for the applicant).

John M. Digney, Esq., for the Board of Water Commissioners of the village of White Plains, in support of the application.

Messrs. Barrett & Buckbee (H. R. Barrett, Esq., of Counsel for the Board of Trustees of the village of White Plains) objecting.

The applicant, Mr. John A. Drew of the city of New York, proposes to engage in supplying the inhabitants of a portion of the town of Greenburg and a portion of the town of White Plains with underground water for domestic and municipal purposes, taking his supply from a large, flat area situate in the town of Greenburg, northwest of the village of White Plains in the valley of the Bronx river, about one mile south of the Kensico reservoir of the New York city water supply system. The plans proposed include sinking eight or ten wells, six inches in diameter to the depth of from 85 to 100 feet, in a territory of about five and one-half acres in extent and building a pumping station in the vicinity of the wells, capable of delivering at least 3,000,000 gallons per twenty-four hours. Prior to the filing of this application and on June 24, 1910, the Board of Water Commissioners of the village of White Plains entered into a contract with Mr. Drew by which the latter agreed to furnish into the mains and pipes of the White Plains village system and under sufficient pressure, from one to three million gallons per day of pure and potable water situable for domestic and manufacturing purposes, and the Board of Water Commissioners agree to take this water in quantities of not less than 1,000,000 gallons per day for a period of fifteen years and pay for the same at the rate of $80.00 per million gallons for the first million gallons, and at the rate of $75.00 per million gallons for the next two million gallons or fraction thereof. The source of this supply of water was not stated in the contract, but on the hearing was shown to be from the lands and plans described in the application filed after the making of the contract.

The only objections that were filed upon this application were those of the board of trustees of the village of White Plains; they were in substance:

(1) That the territory proposed to be used as a source of water supply is adjacent to the territory now owned and used by the village of White Plains, should be reserved for the village of White Plains for its future use and should not be allowed to be taken by a private company.

(2) That the board of trustees of the village of White Plains disapprove of the action of the Board of Water Commissioners of the village of White Plains, in making the proposed contract.

(3) That action of the Board of Water Commissioners in making the contract with Drew is at this time unnecessary for the reason that its own watershed, if properly developed, would furnish sufficient water for some time to come. Considering the first objection and giving to it the widest meaning, that the plans of the applicant are not just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

It appears that the villages of Tarrytown, Irvington, Dobbs Ferry, Hastings-on-Hudson and Ardsley, all in the town of Greenburg, have public water supplies and that the remaining portion of the town, having a population of about eight thousand, which is rapidly increasing and which is one of the localities the applicant desires to serve, is without a public supply; that applications for such public service have been made and tentative contracts entered into with various customers who desire to use the water and have the benefit of the fire protection to be furnished by the proposed plans. So far as the proposed plans affect the village of White Plains, it was conclusively shown by the testimony taken at the hearings in this matter that the sources of water supply of the village of White Plains as now developed were grossly inadequate to furnish the quantity of water required for the daily use of its inhabitants; that a water famine was impending and that the Board of Water Commissioners had obtained a temporary and uncertain supply from the New York city system at an expense of $133.33 per million gallons; $53.33 per million gallons more than the price agreed upon under the Drew contract.

This Commission believes that it was the first duty of every municipality to own, operate and control its own water supply system, but no application has been made up to the present time, by the municipal authorities of the village of White Plains to obtain the sources of supply discovered by the petitioner, and embraced in his application, and upon the hearing it was sought to be proven by several witnesses in behalf of the objectors that the present sources of supply for the village could be further developed so as to produce an additional, if not sufficient, supply for some time to come. It can hardly be fair and equitable to that portion of the town of Greenburg, which the petitioner desires to supply with water, to say that this application is not justified by its public necessity, and to deny this application holding the sources of the applicant's supply for the possible use of the village of White Plains until it determines whether or not it can elsewhere obtain a sufficient supply.

The consent of the State Water Supply Commission has heretofore been given upon the application of the village of White Plains to obtain an additional supply of water from the upper sources of the Mamaroneck river, nevertheless it is for the village authorities to decide whether or not they will take advantage of the discovery by the applicant of an underground source of supply and utilize this source to make up the deficiency in their present supply in advance of any effort on their part to proceed under the consent already given to develop the Mamaroneck river source.

The second and third objections have no relevancy to the present application. Whether or not the contract made between the applicant and the village authorities was a necessary or legal contract, cannot come before this Commission, upon this application for its determination; neither has it a bearing upon the question of public necessity sufficient to justify this Commission in denying this application. The contract might be unnecessary and beyond the power of the village board to make, yet there might be, as is the fact, public necessity and demand on the part of the various localities affected by the application for a public water service.

Analysis of the water to be supplied shows it to be suitable for all domestic purposes.

The application is therefore approved.

The State Water Supply Commission determines:

(1) That the plans proposed are justified by public necessity.

(2) That such plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to the present and future necessities for sources of water supply.

(3) That said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property both direct and indirect which will result from the execution of said plans and the acquiring of said lands.

IN WITNESS WHEREOF, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission [L. S.] and caused its official seal to be hereto affixed and the same with all plans, maps, surveys, and other papers relating thereto filed in its office in the city of Albany, this 10th day of January, 1911.

HENRY H. PERSONS,
President.
MILO M. ACKER,
CHARLES DAVIS,
JOHN A. SLEICHER,
ROBERT H. FULLER.

APPLICATION NO. 92.

ANGOLA (incorporated village), Town of Evans, Erie County.

Petition filed December 7, 1910.

Hearing held December 16, 1910.

Village has no public system of water supply, the inhabitants depending upon dug wells for water.

The petition asked for approval of plan to sink a well in sandy soil on shore of Lake Erie. Pumping plant at well. A brick station in which two pumps driven by gas engine equipped to use either natural gas or gasoline. Each pump to have a capacity of 350 gallons a minute. Combined capacity 1,000,000 gallons. Water will be filtered through natural sandy beach into brick wall fifteen feet in diameter and twenty feet deep. A ten inch force main to be laid from pumps to a standpipe near center of village 127 feet above lake level, 20 feet in diameter, 100 feet high with a capacity of 236,000 gallons. Distributing system of 8-inch and 6-inch pipes in all streets and 50 hydrants. Pressure at hydrants will be 56 lbs.

Analyses showed the water to be very excellent potable water.

Total cost of proposed project $55,000.

Population 900.

The Commission approved the application December 29, 1910.

Decision filed December 29, 1910.

STATE OF NEW YORK — STATE WATER SUPPLY COMMISSION.

In the Matter
of the
Application of the Village of Angola for a new and additional source of water supply.

Decision.

This application was made to the Commission on the 15th day of December, 1910.

The village of Angola, with a population of 930 people was incorporated in the year 1872 or thereabouts. It is situate nearly two miles east of the shore of Lake Erie in the western part of Erie county.

The tracks of the Lake Shore, a four-track railroad and the tracks of the Buffalo and Lake Erie Traction company run through the center of the village. The Nickel Plate and the Pennsylvania Railroad stations are situate within a few rods of the corporation line of this village.

The principal industries in the village are a bicycle manufacturing plant, a flour mill and a macaroni manufacturing company. The property in the village on an assessment basis of 33⅓% is valued at $370,000. Nearly all of the buildings are of wood, consisting of dwellings surrounded by the usual outbuildings besides stores and other business places.

At the present time, the village depends upon the usual dug or driven well for its potable water supply, and upon small cisterns and two hand pumps for fire protection.

Most of these wells for potable water have been in use many years. A long use of wells conduces to the drainage of cesspools, closets and barn yards into them. Although there was no direct evidence given on the hearing showing that the wells in this village had been contaminated from such sources, it is, nevertheless, true that most old wells situate in a village like this, sooner or later come to be drainage receptacles.

Any system of cisterns and hand pumps is wholly inefficient for fire protection. It is, therefore, clear to the Commission that there is a public necessity for a new water supply for this village.

The plan of the village is to sink a well at a point two miles from the center of Angola village and about 120 feet from the Lake Erie shore. The well will be sixteen feet deep and supplied by water from the lake which will percolate through the fine sands. This percolation removes any deleterious substance that may be in the lake water. The well is to be carefully protected from pollution and a pumping plant erected with duplicate units, each of which will have a capacity of 350 gallons per minute. The water is to be pumped from this well into a standpipe erected on the high ground in the village twenty feet in diameter, 100 feet high and with a capacity of 236,000 gallons. It will be connected by a ten-inch main with a distribution system extending to all parts of the village, supplying nearly every house and connected with fifty double fire hydrants not over 500 feet apart.

The standpipe when full will furnish, without pumping four fire streams through one and one-quarter inch nozzles for four hours. By pumping, these streams could be furnished almost perpetually.

The plans of the proposed plant appear to the Commission to be both ample and practicable and have the approval of our Consulting Engineer.

In all probability the village can sell to the various railroads running through and near it and to the Connor's poultry plant large quantities of water at a rate which will be profitable to both the village and consumer.

Taking water from Lake Erie removes all question of interfering with the water supply in any other municipality or civil division of the State.

A village election has been held and a bond issue for building the proposed plant voted. From the sale of such a bond issue, the village proposes to buy all necessary lands and pay all damages, both direct and indirect, that may result from building such municipal plant.

The State Water Supply Commission, therefore, finds and determines:

First.— That the plans of the applicant for a new source of water supply are justified by public necessity.

Second.— That the plans of the applicant are just and equitable to other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Third.— That said plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans, or the acquiring of said lands.

The Commission, therefore, approves the plans of the applicant for a new source of water supply.

In witness whereof, The State Water Supply Commission hath caused this determination and approval to be signed by the Commission [L. S.] and caused its official seal to be hereto affixed and the same with all plans, maps, surveys, and other papers relating thereto filed in its office in the city of Albany, this 29th day of December, 1910.

HENRY H. PERSONS,
President.
JOHN A. SLEICHER,
MILO M. ACKER,
CHARLES DAVIS,
ROBERT H. FULLER,
Commissioners.

APPENDIX B.

LAWS RELATING TO THE COMMISSION.

Article 2, State Boards and Commissions Law, Relating to Municipal Water Supplies and River Improvements for Preservation of Public Health and Safety.

Chapter 569, Laws of 1907, Relating to Water Power and Storage Investigations.

PREFATORY NOTE.

The general laws establishing the State Water Supply Commission and prescribing its powers and duties relating to municipal water supplies were consolidated by chapter 56 of the Laws of 1909, with the laws prescribing the Commission's powers and duties relating to river improvements for the preservation of the public health and safety. These laws are now embodied in article 2 of chapter 54 of the Consolidated Laws, which chapter constitutes the State Boards and Commissions Law.

Chapter 569 of the Laws of 1907, directed the State Water Supply Commission to devise plans for the progressive development of the water powers of the State under State ownership, control and maintenance for the public use and benefit and for the increase of the public revenue. Because of its preliminary and temporary character, this act was not included in the Consolidated Laws. The act is, however, still in force and is reproduced hereinafter, following article 2 of the State Boards and Commissions Law.

APPENDIX B.

LAWS RELATING TO THE COMMISSION.

STATE BOARDS AND COMMISSIONS LAW.

ARTICLE II.*

State Water Supply Commission.

Section 5. State water supply commission.
6. Municipal corporations must submit maps and profiles of new or additional sources of water supply.
7. Petition for approval of plans for water supply and proceedings thereupon.
8. Powers of commission on investigation of plans for water supply.
9. Acquiring of land by aqueduct commissioners of New York city not affected.
10. Petition for river improvement.
11. Determination upon petition for river improvement.
12. Proceedings upon approval of petition for river improvement.
12-a. Creation of improvement districts.
13. Proceedings after final order approving petition for river improvement.
14. Entry upon lands, structures and waters in proceeding for river improvement.
15. Compensation of owners upon failure to agree in proceeding for river improvement.
16. Warrant for payment of owners upon failure to agree in proceeding for river improvement.
17. Bonds for river improvement.
18. Proceedings for apportionment of cost of river improvements.
19. Proceedings for assessment and collection of cost of river improvements.
20. River improvement certificates.
21. Operation, maintenance and expenses of river improvements and unlawful opening of gates of dam.
22. Construction of provisions relating to river improvements.
22-a. Duties and qualifications of collectors and other officers.
22-b. Ratification of proceedings for improvements.
23. Investigation and report as to state system of water supply and sewerage.
24. Annual report by commissioners to legislature.
25. State jurisdiction of the improvement of water courses at private expense.
26. Refund of expenses in certain cases.

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* As amended by chapter 284, Laws of 1909, in effect May 4, 1909; chapter 464, Laws of 1909, in effect May 24, 1909; and chapter 285, Laws of 1910, in effect May 13, 1910.

§ 5. **State water supply commission.**— The state water supply commission is continued. The commission shall consist of five members appointed by the governor by and with the advice and consent of the senate. One of the members shall be designated as president. Any three of said commissioners shall constitute a quorum for the transaction of business. The commission shall make necessary rules and regulations for the proceedings hereunder. The commission shall have an official seal. The term of each member of the commission shall be five years, except that the members of said commission first appointed shall hold office respectively one for one year, one for two years, one for three years, one for four years, and one for five years, and as the term of each commissioner expires or otherwise becomes vacant his successor shall be appointed in the manner hereinbefore provided for the appointment of the original commissioners. The members of the commission shall receive an annual salary of five thousand dollars each and be paid their necessary and reasonable expenses actually incurred in the prosecution of their duties, payable monthly. The commission is hereby authorized and empowered to employ a secretary and such engineers, stenographers, clerks and other subordinates as the duties imposed upon them by this article may require, and to fix and pay the reasonable salaries and expenses of such officers, and of all other subordinates for the purpose of proceedings by them under this article.

§ 6. **Municipal corporations must submit maps and profiles of new or additional sources of water supply.**— No municipal corporation or other civil division of the state, and no board, commission or other body of or for any such municipal corporation or other civil division of the state shall, nor shall any person or water-works corporation engaged in supplying or proposing to supply the inhabitants of any municipal corporation or other civil division of the state with water, after this chapter takes effect, have any power to acquire, take, or condemn lands for any new or additional sources of water supply, until such person, corporation or civil division, has first submitted the maps and profiles therefor to said commission, as hereinafter provided, and until said commission shall have approved the same, or approved the same with such modifications as it may determine to be necessary as hereafter provided.

§ 7. **Petition for approval of plans for water supply and proceedings thereupon.**— Any municipal corporation or other civil division of the state, or any person or water-works corporation, may make application by petition in writing, to the said commission for the approval of its maps and profiles of such new or additional source or sources of water supply. Such application shall be accompanied by an exhibit of maps of the lands to be acquired and profiles thereof showing the sites and areas of the proposed reservoir and other works, the profiles of the aqueduct lines and the flow lines of the water when impounded, plans and surveys and abstract of official reports relating to the same showing the need for a particular source or sources of supply and the reasons therefor, and shall be accompanied by a plan or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of said lands and the execution of said plans. Such petition shall also be accompanied by such proof as to the character and purity of the water supply proposed to be acquired as the state water supply commission shall require. If such petition is made by a person or water-works corporation, it shall be accompanied by an undertaking in such amount and with such sureties as the state water supply commission shall determine, that such person or water-works corporation will pay the expenses of the hearing and determination as hereinafter provided. Said commission shall thereupon cause public notice to be given that on a day therein named the commission will meet at its office in the city of Albany, or at such other place as it may particularly specify in said notice, for the purpose of hearing all persons, municipal corporations or other civil divisions of the state that may be affected thereby. Such notice shall be published in such newspapers and for such length of time, not exceeding four weeks, as the commission shall determine. At any time prior to the day specified in such notice any person or municipal corporation or the proper authorities of any civil division of the state may file in the office of the commission at Albany objections to the project proposed by such application. Every object so filed shall particularly specify the ground thereof. Said commission shall, upon the day specified in said notice, or upon such subsequent day or days to which it may adjourn the hearing, proceed to examine the said maps and profiles and to hear the proofs and arguments submitted in support of and in opposition to the proposed project, but no person, municipal corporation or local authorities shall be heard in opposition thereto except on objections filed as authorized by this section. The commission shall determine whether the plans proposed are justified by public necessity and whether such plans are just and equitable to the other municipalities and civil divisions of the state affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply, and whether said plans make fair and equitable provisions for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands. Said commission shall within ninety days after the final hearing and with all convenient speed either approve such application and plans as presented or with such modifications in the application and plans submitted as it may determine to be necessary to protect the water supply and the interests of the applicant or of the inhabitants of the territory supplied by it with water, or the water supply and interests of any other municipal corporation, or other civil division of the state, or the inhabitants thereof, or the water supply and interests of any other person or water-works corporation, engaged in supplying water to any other municipal corporation or other civil division of the state or the inhabitants thereof; or to bring into co-operation all municipal corporations, or other civil divisions of the state, which may be affected thereby; or to make just and equitable the submitted plan or scheme to determine and provide for the payment of the proper compensation for any and all damages to persons or property, whether direct or indirect, which will result from the acquiring of said lands and the execution of said plans; or it may reject the application entirely or permit another to be filed in lieu thereof, but it shall, however, make a reasonable effort to meet the needs of the applicant, with due regard to the actual or prospective needs and interests of all other municipal corporations and civil divisions of the state affected thereby and the inhabitants thereof.

Whenever the commission shall make a decision on any application submitted to it, it shall state the same in writing and sign the same and cause its official seal to be affixed thereto and file the same, together with all plans, maps, surveys and other papers or records relating thereto in its office. The decision of the commission and its action on any application may be reviewed by certiorari proceedings. The expense of any such hearing and determination by the commission shall be certified by said commission to the person, water-works corporation, municipal corporation or other civil division of the state making such application and shall be paid by said applicant within thirty days thereafter upon the certificate of the commission to the persons entitled thereto.

§ 8. **Powers of commission on investigation of plans for water supply.**— Said commission shall have power to subpœna and require the attendance in this state of witnesses and the production by them of books and papers pertinent to the investigation and inquiries which it is authorized to make by this article, and to examine them and such public records as it shall require in relation thereto. And for the purposes of the examinations authorized by this article, the commission shall possess all the powers conferred by the legislative law upon a committee of the legislature or by the code of civil procedure upon a board or committee, and may invoke the power of any court of record in the state to compel the attendance and testifying of witnesses and the production by them of books and papers as aforesaid.

§ 9. **Acquiring of land by aqueduct commissioners of New York city not affected.**— Nothing contained in the preceding sections shall in any way affect the acquiring of lands by the acqueduct commissioners of the city of New York under the provisions of chapter four hundred and ninety of the laws of eighteen hundred and eighty-three as heretofore amended.

§ 10. **Petition for river improvement.**— Any county, city, town or village located upon any river or water course, or any person or persons possessing riparian rights thereon, may present to the commission a petition duly verified, setting forth the facts showing that the restricted or unrestricted flow thereof is a menace to the public health and safety and that it is necessary to the preservation of the public health and safety to regulate the same, and praying that the flow of water in such river or water course shall be regulated under the following provisions of this article, so far as necessary for that purpose. Such petition may be made on behalf of any county by the board of supervisors thereof, on behalf of any town by the supervisor thereof, on behalf of any city by the mayor or board of aldermen thereof, on behalf of any village by the president or board of trustees thereof.

§ 11. **Determination upon petition for river improvement.**— Such commission on receipt of any such petition shall forthwith determine whether the regulation of the flow of any such river or water course is of sufficient importance to the public health or safety to warrant the interference of the state under the provisions of this article, and shall certify its determination thereupon. If it shall determine that the relief prayed for should be granted, such commission shall at once make or cause to be made such preliminary surveys and investigations as may be proper to determine the causes of the excessive, restricted or irregular flow in such river or water course, the available means to correct the same for the preservation of the public health and safety, and if relief therefrom is in the opinion of the commission practicable, to take such other and further action with reference to relieving the same as is hereinafter provided for.

§ 12. **Proceedings upon approval of petition for river improvement.**—If such commission shall determine that a more beneficial flow of water in such river or water course can be had by construction of dykes, clearing out or changing the channel, the erection of a dam or dams or other public works thereon, or upon any tributary thereof, it shall cause to be made preliminary plans and specifications of such proposed improvements, together with a survey of the lands upon which such improvements are to be located, giving the location thereof, and of all lands to be taken, flowed or damaged thereby, with a description by survey or otherwise, of all rights affected thereby, and estimates of the total cost thereof. The commission shall also cause a map to be made showing all such lands, the number of acres in each separate tract and the names of the owners and occupants thereof so far as the said commission can ascertain the same. The commission or the members thereof may enter upon such lands as the commission shall deem necessary for the purpose of doing such work, either by themselves or by their engineers, agents or servants employed by them for that purpose. The commission shall also prepare a statement or list of the counties, towns, cities, villages and individual properties which in its judgment will be benefited thereby, together with a statement of the proportional share of said total cost which should be borne by the said counties, towns, cities and villages respectively, and by the individual owners of property benefited collectively, expressed in decimals; and in case any part or proportion of the cost of such improvement is not properly assessable upon the counties, towns, cities, villages or individual properties, or any of them, as not in the nature of a local improvement, such part or proportion of the expense shall be deducted from the total cost before apportioning the same upon the counties, towns, cities, villages and individual properties as aforesaid, and shall be certified by the said commission to the legislature as a state charge. Said preliminary maps, plans, specifications, estimates and statments shall thereupon be filed in the office of the county clerk of any county benefited and of each county in which any of the aforesaid towns, cities, villages or individual properties benefited are situated. Upon the completion and filing of such preliminary maps, plans, specifications, estimates and statements, the commission shall give notice of the filing thereof, and of the time and place where said commission will give a hearing to persons interested therein, by advertising for five weeks in two newspapers published in each county where such improvement is proposed to be made, and in the state paper published at Albany, at which time and place any person interested may appear, and make any objection to or suggest any modifications in said plans and specifications, and said commission shall have power to adjourn said hearing from time to time as justice may require. Thereupon said commission shall determine whether such proposed improvement shall be abandoned or proceeded with, and what, if any, modifications should be made in said plans, specifications, estimates and statements. If said commission shall determine that said maps and plans should be modified so as to include territory to be benefited or otherwise, not included in the maps, plans and statements already filed, then they shall cause modified maps, plans, specifications, estimates and statements to be prepared and filed as hereinbefore provided, for said preliminary maps, plans, specifications, estimates and statements, and shall give notice of their completion and filing and of a hearing thereupon, in the manner hereinbefore prescribed for a hearing upon said preliminary maps, plans, specifications, estimates and statements. If said commission shall finally determine that the proposed improvement be made, it shall thereupon make a final order directing the same to be made, and shall cause to be prepared a final map, detailed plans, specifications and estimates of the total cost thereof. The commission shall cause the said final order, map, plans, specifications and estimates, or duplicates thereof, certified by them, to be filed in the office of the county clerk of each county in which lands affected or benefited thereby are located. No such improvement shall be undertaken under this article pursuant to any such final order, or any other proceedings had thereon except as hereinbefore provided, until after the said final order shall have been approved by a subsequent act of the legislature which act shall authorize and direct such improvement to be made. If so approved, the said final order shall become effectual and not otherwise.

§ 12-a. **Creation of improvement districts.**— At any time after such final order shall have been approved by the legislature the commission shall determine what property included in the statement or list as specified in section twelve of this chapter, other than counties, towns, cities and villages, is to be benefited by such improvement, and it shall thereupon cause to be made a survey and map showing the lands so determined to *benefited and the name of the owner of each separate parcel so far as practicable, the quantity in each parcel and the boundary lines thereof and where a parcel is intersected by a town or county line the quantity in such parcel on each side of the town or county line; and shall give to each parcel a corresponding number on said survey and map; and it shall also cause to be made a brief description or designation sufficient to indentify the same, of all other property included in such statement or list so determined to be benefited, with the name of the owner thereof so far as practicable. When said survey and map and descriptions are completed a copy thereof with a certificate of their adoption duly signed by the commission shall be filed in the office of the clerk of each county in which any lands or property so determined to be benefited are situated or exist; and thereafter the commission shall fix a time and place in such county where the owners of said lands and property and other persons interested therein shall have an opportunity to be heard as to the lands and property to be benefited. Notice of the time and place of such hearing shall be given by the commission by notice published at least once a week for two successive weeks immediately prior to the time of such meeting in at least two newspapers published in such county. After such hearings, which may be adjourned from time to time by the commission or by any member thereof, the commission may make any change in its determination as to the lands and property to be benefited; in case of any such change the commission shall make a supplemental survey and map and descriptions, in like manner as is hereinbefore provided with reference to the original survey and map and descriptions, showing such changes, and file in the clerk's office of each county where the lands and properties affected by such changes are situated or exist a copy of such supplemental survey and map and descriptions with a certificate of their adoption duly signed by the commission; and thereupon such original survey and map and descriptions, as modified by such supplemental survey and map and descriptions, if any, shall constitute the final determination of the commission as to the lands and property to be benefited by such improvement. Such final determination may be reviewed in like manner as a review is had of a determination of a board of assessors in making an assessment. Such determination as modified upon such review, if any, shall conclusively fix and establish the lands and properties benefited by said improvement, and the same together with the counties, towns, cities and villages included in said statement or list shall constitute an improvement district; and the proportional share of the total cost of such improvement and of the maintenance thereof so apportioned to the state and the counties, towns, cities and villages as provided in section twelve of this chapter shall be a charge upon and be payable by the state and said counties, towns, cities and villages respectively, and the proportional share thereof collectively charged upon the lands and properties within such improvement district as in this act provided shall be a lien upon all the lands and properties within such improvement district and shall be borne by and assessed and levied upon and collected from such lands and properties in the manner hereinafter provided.

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* So in the original.

§ 13. **Proceedings after final order approving petition for river improvement.**— When any such final order shall have been made and approved by an act of the legislature as hereinbefore provided, such commission shall advertise two successive weeks in the state paper and in two newspapers published in the county wherein such work is to be performed, and if in more than one county then in each of such counties, and in such other newspaper as shall be deemed of advantage, for bids or proposals for said work to be made in writing for the construction of such dam or dams, dykes or other works according to such plans and specifications. Upon the receipt of the proposals, such commission may enter into a contract or contracts with the lowest responsible bidders for the work to be done, or may reject any or all bids and again advertise for further bids. Before entering into any such contract, a bond with sufficient sureties shall be required, conditioned that the contractor will perform all work within the time prescribed in accordance with the plans and specifications, and will indemnify the state and said commission of and from all liability for damages occasioned or suffered by reason of the negligence or wilful fault of such contractor, his employees or any subcontractor or his employees in doing such work. Partial payments for work actually done may be provided for in the contracts and paid in the manner hereinafter provided to an amount not to exceed ninety per centum of the contract price. The payments due on account of any such contracts or for any necessary expense or work in connection therewith in pursuance of this article shall be paid from the river improvement fund as hereinafter provided for.

§ 14. **Entry upon lands, structures and waters in proceeding for river improvement.**— The commission may enter upon any land, structures and waters necessary for the purposes of this article so far as the same relates to proceedings for the improvement of rivers and water courses; and it may determine that the right to temporary or perpetual use and occupancy of the property to be taken for the purpose of such improvement is a sufficient title and interest to be acquired therein. If the owner of any property to be taken for such improvement shall agree with the commission upon the sum to be paid therefor, or for the right to use and occupy the same or for any damages sustained, such sum shall be paid as hereafter provided as part of the necessary expense incurred for the purpose of such improvement.

§ 15. **Compensation of owners upon failure to agree in proceeding for river improvement.**— If the commission can not agree with the owners upon the compensation and damages to be paid for the property to be so taken and appropriated, the commission shall thereupon serve upon such persons a notice that the lands and property described therein have been appropriated by the state for the purposes of this article, and shall proceed to acquire title thereto under the provisions of title one of chapter twenty-three of the code of civil procedure, known as the condemnation law.

§ 16. **Warrant for payment of owners upon failure to agree in proceeding for river improvement.**— When proceedings are taken under the condemnation law as provided in the preceding section the commission shall file in the comptroller's office a certified copy of the final order provided for in section thirty-three hundred and seventy-one of the code of civil procedure, and a certified copy of the judgment therein rendered pursuant to section thirty-three hundred and seventy-three of said code, together with a certificate of the attorney-general that no appeal from such final order and judgment has been or will be taken by the state, or if an appeal has been taken, a certified copy of the final judgment of the appellate court affirming in whole or in part said final judgment. The comptroller shall issue to the said commission or such officer thereof, as it shall direct, his warrant for the payment of the amount due upon such final order and judgment with interest from the date of the judgment until the thirtieth day after the entry of such final order and judgment, and the same shall be paid out of the river improvement fund hereinafter provided for. Such warrant shall be payable to and shall be delivered by the commission or its officers to the owner or owners of said judgment according to the terms thereof.

§ 17. **Bonds for river improvement.**— To pay the cost of such improvement and all the expenses and liabilities lawfully incurred by the commission under this article in connection therewith and the maintenance thereof and the certificates authorized by this article to be issued and the interest thereon the commission is hereby authorized to issue, in the name of and under the seal of said commission, in behalf of such improvement district, bonds in a sum not exceeding the amount of the estimated total cost of said improvement and ten per centum thereof in addition thereto, unless the legislature shall under the provisions of section twelve of this chapter authorize the expenditure of an additional amount in excess of ten per centum of the amount of said estimated cost by a further final order as therein provided, in which case such bonds may be issued for such additional amount. Such bonds, together with interest thereon at a rate not exceeding five per centum, payable semi-annually, shall be payable by their terms by the state, municipality and by assessment and levy of taxes upon the lands and properties in such improvement district according to the proportional share thereof determined as herein provided, and they shall be executed when authorized by the commission by the president of the commission and attested by the secretary thereof. Such bonds shall be issued in serial form in amounts to be fixed by the commission; they shall by their terms become due and payable as determined by the commission in not exceeding fifty years from the date of issue, and they shall be exempt from all taxation by the state or by any county, town, city, village or other subdivision of the state, and shall be a legal investment for savings banks, trust companies, executors and trustees. Such bonds shall be sold by the comptroller at not less than par and accrued interest, and the proceeds thereof deposited in a national or state bank either at Albany or in one of the counties in which such improvement is made, to be approved by the comptroller and the president of the commission. But before any such deposit is made, the comptroller shall require from the depository a bond as security for the repayment of the same, to be approved by him as to form, condition and sufficiency of sureties, which shall provide for the repayment to the commission upon demand of the moneys so deposited. Moneys received under the provisions of this article shall constitute a fund to be known as the river improvement fund, and the portion thereof applicable to each improvement shall be separately kept by the comptroller, and the same are hereby pledged to the payment of the cost and expenses of such improvement and the maintenance thereof, and the bonds and certificates to be issued as in this article provided, so far as the same are applicable to such improvement, and the comptroller is authorized and directed to pay therefrom the principal and interest of said bonds as the same mature and become payable by the terms thereof, and the principal and interest of any certificates issued in pursuance of section twenty of this chapter, and the costs and expenses of such improvement and the maintenance thereof upon the order of the commission or the authorized officer thereof. In case the proceeds of the sale of bonds exceed the total amount of the cost and expenses of such improvement, including the interest on certificates, such excess shall be applied by the comptroller to the payment of the principal and interest of such bonds and the maintenance of such improvement.

§ 18. **Proceedings for apportionment of cost of river improvements.**— The commission shall assess upon the lands and properties in such improvement district benefited collectively as determined under the provisions of section twelve of this chapter, the benefit accruing thereto by reason of such improvement in the following manner: It shall determine after an investigation thereof the amount of such benefit received by said lands and properties and shall specify the same in a statement thereof opposite the number of each parcel of land and each designation or description of property corresponding with the number thereof on said survey and map and descriptions of such improvement district with the name of the owner or owners thereof, as the same appear on said map and survey and descriptions; such statement shall be signed by the commission and a copy of so much thereof duly certified by the secretary of the commission shall be filed in the clerk's office of each county as relates to the lands and property included in each county. A copy of such statement shall be served upon the owner or owners of such lands and properties assessed, together with a notice specifying the time and place in the county where the commission shall meet to hear any person interested in or aggrieved by such determination; such service shall be made by delivering the same to each of said owners or to any one of several owners or to the tenant of any such lands or properties or by posting the same upon any such lands or properties; such service shall be made at least fifteen days before such meeting, and said statement and notice shall also be published in at least two newspapers published in the county wherein said meeting is to be held at least two weeks immediately prior thereto. The affidavit of said service and publication shall be evidence thereof. The commission shall meet at the time and place specified in such notice, or at the times and places to which said meeting may be adjourned by the commission or any member thereof, and hear all persons interested in or aggrieved by such determination; after such hearing or hearings the commission may change or modify such determination, in which case it shall specify such change or modification in a statement thereof to be signed and filed by it in like manner as hereinbefore provided with reference to such original determination. Any person aggrieved by such determination as originally made or as so modified may review the same in like manner as a review is had of the determination of a board of assessors in making an assessment. And such determination as so modified and as further modified by any final judgment or order made in proceedings to review the same as herein provided shall be final and conclusive, and the amount of the total cost and expense of such improvement and the maintenance thereof and the bonds and certificates to be issued as in this article provided and the interest thereon, which said several parcels of land and properties are to pay and bear shall be based upon the amount of the benefit accruing to them respectively as specified in and in accordance with said determination as so modified, as hereinafter provided, provided, however, that if any of the properties included in such improvement district and in such determination shall cease to exist, so that no part of the tax to be levied thereon as herein provided can be collected against the same, and due proof thereof shall be made to the commission, the commission may apply to the supreme court for an order to show cause why such property should not be thereafter omitted from the assessment roll of the town or city wherein the same is situated, as herein provided; such order to show cause shall be served upon the owner or owners of all the properties in such improvement district, so far as the same can be ascertained, in such manner as the court shall direct, and in case the court shall upon the return of said order so direct the said property shall be thereafter omitted from the assessment roll of said town or city, with the same force and effect in all respects as if the same had not been included in such improvement district, or in said determination. The commission shall annually transmit to the board of supervisors of each county in such improvement district a statement of the amount required to be paid by the lands and properties in said county included in such improvement district, as specified in the determination of the commission, of bonds issued for such improvement maturing during the then ensuing year together with interest thereon, and of the certificates issued by the commission as herein provided remaining unpaid and interest thereon and of the cost of the maintenance of such improvement for such year, which statement shall be approved by the comptroller, and thereupon said board of supervisors shall cause the same to be levied and collected as hereinafter provided.

§ 19. **Proceedings for assessment and collection of cost of river improvements.**— For the purpose of raising money to meet the said bonds and certificates and the interest thereon, and to provide for the cost and expenses of such improvement and the maintenance thereof the commission shall annually transmit to the comptroller a statement of the amount of the proportion thereof to be paid by the state during such year, in conformity with the determination of the commission in respect thereto as provided in section twelve of this chapter and such amount shall be by the comptroller paid into the river improvement fund herein mentioned applicable to such improvement out of the moneys of the state appropriated for that purpose; and the commission shall annually transmit to the clerk of the board of supervisors of each county, the clerk of each town, the mayor of each city and the president of each village affected by such improvement a statement of the amount of the proportional share thereof to be paid by such county, town, city or village respectively, as determined by the commission, and such county, town, city or village shall cause the same to be assessed, levied and collected in the same manner as provided by law with reference to general taxes, and paid to the treasurer of the county, who shall forthwith forward the same, less his legal fees therefor, to the comptroller to be by him paid into the river improvement fund applicable to such improvement; and the commission shall annually transmit to the clerk of the board of supervisors of each county included in such improvement district a statement of the amount of the proportional share thereof to be borne by the lands and properties collectively in such improvement district within such county during such year, to be assessed, levied and collected as hereinafter provided. The assessors of each town and city included in such improvement district are hereby required to enter upon a separate page in the annual assessment roll of such town or city before the delivery thereof to the board of supervisors the description by number corresponding with the number thereof on said survey and map and descriptions so filed in the county clerk's office, each parcel of land and each designation or description of property within the county in such improvement district, together with the name of the then owner or owners thereof so far as the same can be ascertained by the assessors, and set opposite such number and description of each separate parcel or property in the column of said roll for the total assessed valuation of property the amount of benefit by reason of such improvement received by such parcel or property as stated and specified in the determination of the commission as modified by the court if so modified, on file in the office of the clerk of the county. And the board of supervisors shall each year at the time the annual tax levy is made, levy upon each separate parcel and property in said county within such improvement district appearing upon the assessment rolls of the towns and cities included therein as herein provided such portion of the amount to be paid by all of the property in said county within such improvement district appearing by the statement of the commission and the comptroller made to said board as in section eighteen of this article provided as the amount so assessed against such parcel or property on said rolls for benefit accruing thereto bears to the aggregate amount so assessed on said rolls against all of said lands and properties, and the said taxes so levied shall be collected in the same manner as general taxes are levied and collected, and shall be a like lien as general taxes until the amount thereof is paid to the general treasurer of the county, superior in force and effect to all other liens except unpaid general taxes; provided, however, that the collection of such tax shall only be enforced by a sale of the land or property assessed. Such taxes when collected shall be paid to the treasurer of said county who shall forthwith pay the same less his legal fees to the comptroller who shall pay the same into the river improvement fund.

§ 20. **River improvement certificates.**— To temporarily provide for the expenditures which must be made for such improvement before the proceeds of the sale of the bonds hereinbefore authorized to be issued become available, and to provide for the failure to collect in the manner herein provided in any year the amount required to pay the bonds and interest maturing in that year and the cost of the maintenance for that year of such improvement, the commission is hereby authorized to issue and sell certificates of indebtedness bearing interest at a rate not exceeding six per centum per annum, and the proceeds thereof shall be paid into the river improvement fund applicable to such improvement. A separate issue of certificates may be made for each improvement, the amount thereof to be approved by the comptroller, and not to exceed the aggregate estimated cost of such improvement. Such certificates shall be issued in the name of the commission; signed by the president and attested by the secretary thereof, with the seal of the commission attached, and shall be countersigned by the comptroller and the principal and interest thereof shall be payable upon the requisition of the commission.

§ 21. **Operation, maintenance and expenses of river improvements and unlawful opening of gates of dam.**— The care, control, operation and maintenance of improvements to rivers and water courses provided for in this article shall devolve upon the commission. The commission shall have power to charge to each such improvement undertaken by it such portion of the expenses incurred as it shall determine ratably and equitably is chargeable thereto and to include the same in the apportionment or assessment of the cost and expenses of such improvement. Any person who shall open or close or cause to be opened or closed a gate or gates in any dam constructed under this article so far as the same relates to such improvements without the consent of the commission, shall be guilty of a misdemeanor.

§ 22. **Construction of provisions relating to river improvements.**— The provisions of this article, so far as the same relates to improvements to rivers and water courses, or the proceedings had or the work done in accordance therewith, shall not be construed as annulling or affecting any power of eminent domain, right, privilege or franchise heretofore created or conferred by law or acquired thereunder nor to permit the actual construction of any dam upon the lands which now constitute a private park under and pursuant to article four of the forest, fish and game law, or pursuant to law, without the consent of the owner of such lands.

§ 22-a. **Duties and qualifications of collectors and other officers.**— It shall be the duty of each collector and other official to whom is delegated the performance of any service under the provisions of this chapter to faithfully perform the same, and the collector of each town and the treasurer or collecting officer of each city whose duty it shall be to collect assessments as herein provided shall before entering upon the discharge of his duties execute to the people of the state an undertaking with two or more sureties in the penal sum of twice the amount to be collected by him, and such undertaking shall be approved and filed in the same manner and with the same force and effect as provided by law with reference to an undertaking for the collection of general taxes, and shall provide that he will well and faithfully perform his duty as collector and will pay over to the treasurer of his county and fully account for all moneys received by him under the provisions of this chapter within the same time as provided by law with reference to general taxes. And such collecting officer shall be entitled to receive the same compensation as fixed by law for the collection of general taxes. And each county treasurer whose duty it shall be to receive any assessments or moneys as herein provided shall, before entering upon the discharge of his duties, execute to the people of the state an undertaking in such amount and with such sureties as shall be required by the comptroller, conditioned that he will forthwith pay over to the comptroller upon the receipt thereof by him and account for all moneys which shall come into his hands under the provisions of this chapter and will well and faithfully perform all the duties required of him thereunder.

§ 22-b. **Ratification of proceedings for improvements.**— All proceedings heretofore taken under the provisions of this article, chapter seven hundred and thirty-four of the laws of nineteen hundred and four, and the acts amendatory thereof and supplemental thereto are hereby legalized, ratified and confirmed.

§ 23. **Investigation and report as to state system of water supply and sewerage.**— The commission shall report the present disposition of sewerage of each municipal corporation and other civil division of the state, and, if necessary, of adjoining states, with special reference to said disposition affecting the various municipal corporations and other civil divisions of the state in relation to the water supply of this state. Said commission shall also report the advisability of, the time required for and the expenses incident to, the construction of a state system of water supply and for a state system for the disposition of sewerage, if necessary, for all or any of the municipal corporations and other civil divisions of this state, and make such recommendations connected with the subjects of said investigations herein provided for as said commission shall determine. In said investigation concerning either the water supply or disposition of sewerage, said commission shall, so far as possible, make use of all reports and surveys in regard thereto which have heretofore been made. For the purposes of such investigations as are provided for in this section said commission shall have all the powers and authority conferred by section eight of this chapter.

§ 24. **Annual report by commissioners to legislature.**— The commission shall annually on or before the first Monday in February in each year submit a written report to the legislature. This report shall contain:

1. An exhibit of the personnel of the commission and of all engineers and other persons connected with the commission.

2. A financial statement showing fully and clearly the condition of the finances of the commission, the amounts and dates of maturity of all bonds and certificates of indebtedness, the amounts of money received and their sources; the amounts of money paid and the purposes for which the same were paid.

3. A statement of the several petitions received by the commission and the action taken thereon.

4. A descriptive statement of each work of improvement on which work has been done during the previous year.

5. A statement of the conditions of improvements previously completed and the results secured by the work of improvement in each case.

In addition to the details as outlined above, the commission shall report to the legislature such other matters as it shall deem proper.

§ 25. **State jurisdiction of the improvement of water courses at private expense.**— The board of trustees of any village may present to the state water supply commission a petition requesting such commission to assume jurisdiction of the construction of a proposed improvement to a water course adjacent to or in the vicinity of such village. Such petition shall state the location of such water course, the character of the proposed improvement, the estimated cost thereof, shall set forth the fact that unless such improvement is made such water course is a menace to the public health and safety of the inhabitants of such village, and shall request that the commission assume jurisdiction of the construction of such improvement, as provided by this section. The petition must also state that if the state water supply commission assumes jurisdiction of such improvement the money needed therefor will be deposited to the order of the commission in a national bank to be designated by it. The petition shall be accompanied by a plan for such improvement, together with an estimate of the cost thereof, prepared by a competent engineer. Upon the receipt of such petition, the commission shall forthwith cause an investigation to be made and shall determine whether the proposed improvement is of sufficient importance to the public health or safety to warrant the commission in assuming jurisdiction. If it shall determine in the affirmative, the commission shall cause to be made an estimate of the cost thereof, and upon the deposit of money in an amount equal to such estimated cost, the commission shall cause such improvement to be made substantially in accordance with the plan proposed by the petition. If such improvement involves the acquisition of land or water rights the commission may acquire the same by condemnation, if unable to agree upon a purchase price, and shall pay the expenses of proceedings and the awards therein out of the money deposited to its credit. If the improvement consists of the construction or improvement of a dam, the petition may state the levels at which it is proposed to maintain the water stored by such dam, and if the commission accepts jurisdiction of the construction of such improvement in accordance with this section, it shall cause the water stored by such dam to be maintained at the level specified in such petition.

§ 26. **Refund of expenses in certain cases.**— If subsequent to the construction of such improvement at private expense as provided by this section, the state shall improve such water course, pursuant to the provisions of this chapter, and the dam or other structure constructed or improved at private expense, as provided by this section, would naturally constitute a part of the plan for the improvement of such water course by the state, the persons by whom the money to make such improvement was contributed may present a claim therefor to the court of claims. Jurisdiction is hereby conferred upon the court of claims to hear such claims, and if the court shall determine that the improvement was paid for by the claimants and would have naturally constituted a part of the improvement of such water course by the state if such improvement had not already been made at private expense, the court shall award to such claimants the amount of money contributed by them toward such expense, and the amount of such awards shall be payable from the money appropriated for the greater improvement of which such improvement would naturally constitute a part.

CHAPTER 569, LAWS OF 1907.

AN ACT authorizing and directing the state water supply commission to devise plans for the progressive development of the water powers of the state for the public use under state ownership and control, and making an appropriation therefor.

Became a law, July 12, 1907, with the approval of the Governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. After the passage of this act, the state water supply commission is authorized and directed to devise plans for the progressive development of the water powers of the state under state ownership, control and maintenance for the public use and benefit and for the increase of the public revenue.

§ 2. The commission shall proceed at once to collect information relating to the water powers of the state and shall devise plans for the development of such water powers, as it deems available and may devise plans for the development of such other water powers as shall be brought to its attention by the mayor of any city, the president of any village, a supervisor of any town or the chairman of the board of supervisors of any county, by a petition verified and filed with it, praying for the development of such water powers. Each such petition shall show and set forth the public purposes to be served by the development therein proposed, and the commission may subpœna the petitioner or petitioners and such other persons as may be deemed desirable to appear before it and to testify under oath, which oath may be administered by any member of the commission, as to the statements made in the petition and as to other matters relating to the subject thereof.

§ 3. The commission shall present a report to the governor and the legislature on or before the first day of February, in the year nineteen hundred and eight, showing the progress made in its investigation, and shall, if practicable, complete its investigations to such extent as will enable it to devise a comprehensive and practical plan for the general development of the water powers of the state, and shall, if practicable, make the final report of such plan to the governor on the first day of February, in the year nineteen hundred and nine. The governor shall, if practicable, submit the said final report with his own recommendations, if any, relating thereto, to the legislature on or before the twentieth day of March, nineteen hundred and nine. In addition to the number provided by law, two thousand copies of the reports of the commission and the recommendations of the governor shall be printed.

§ 4. If any plan devised by the commission shall include the construction of a dam or dams upon any river or water course, the commission shall ascertain and report as nearly as practicable, the water storage capacity in cubic feet of the reservoir created by each such proposed dam, the recorded rain fall on the watershed above such proposed dam, and the maximum, minimum and average flow of water, per second, in cubic feet during each month in the year at the point where it is proposed to locate such dam. They shall, as nearly as practicable, estimate the water horse power which would be developed at such proposed dam, the probability of selling such water power, and the probable gross and net revenues from both direct and indirect sources which would be derived from the sale of such power at such proposed dam. It shall also state the relation of such gross and net revenues to the total cost of the construction, annual maintenance and depreciation, including the cost of necessary lands and riparian rights, and cost of acquiring them, and after deducting the annual cost of maintenance and depreciation, the net revenues which would be annually derived therefrom, and the length of time in which such net revenues would pay off the whole cost of construction, lands and riprarian rights with the interest thereon. The commission may include such other matters as it shall deem proper, in its report to the legislature.

§ 5. The reports of the commission shall specifically designate and recommend what work in their opinion, should be first undertaken and what work should be thereafter undertaken in the order of the importance thereof to the state.

§ 6. In order to determine the probable gross revenues, the rate of charge for the use of the water horse power under contract for sale shall be based upon the aggregate cost of the development, including the land and riparian rights of the single project, the cost of its superintendence, maintenance and depreciation, and the aggregate water horse power available from that single project, and such rate of charge shall be so adjusted that it will produce a net revenue sufficient to pay, in addition to all costs of superintendence, maintenance and depreciation, the interest upon the bonds as the same shall become due and the principal of said bonds at their maturity.

§ 7. Surveys, plans, maps, calculations and estimates of cost may be made to determine the feasibility of any specific project for water-power development.

§ 8. All final surveys, plans, maps, calculations and estimates made pursuant to the provisions of this act shall be made with the same accuracy that would be requisite if the work and project so surveyed had been ordered to be done, and all surveys, plans, maps, calculations and estimates relating thereto shall be preserved for record and reference.

§ 9. The commission in its reports shall treat the general plan it shall devise and recommend for the development of the water power of the state as one state project and shall treat the specific and separate schemes of development as parts of the whole in order that the legislature and the people may have before them at once the most complete and comprehensive statement of the possibilities of the water power of the state and detailed as well as the aggregate cost of the development in such general plan proposed to be made.

§ 10. The commission in its final report shall also include the draft of a bill for a general law providing for carrying its recommendations into effect. It shall give such particular and detailed description of the several separate and specific schemes of development which are parts of the whole as may be necessary to designate clearly the work to be done, and such particulars as to each project shall be stated separately. Such bill shall include a financial plan providing for the issue of the bonds of the state in such amounts as may be required for paying the cost of the water power development to be made, how and when the bonds shall be issued and sold, the term for which they are to run, the rate of interest thereon, the annual tax to pay and sufficient to pay the interest thereon when due and the principal thereof when the same shall mature. The bill shall provide for the creation of a sinking fund into which the moneys received from the tax by such bill levied shall be paid, and into which the net revenues received from the sale of water power shall be paid, until the moneys in such sinking fund shall be sufficient to fully provide for the payment of the principal of all such bonds and the full interest thereon to the date of their maturity, and the tax shall then be discontinued under the provisions of article seven, section eleven, of the constitution. The bill shall provide for a separate issue of the bonds of the state for each separate scheme of development and for the submission of the bill to a vote of the people for their approval at a general election as provided in article seven, section four, of the constitution for the creation of a debt.

§ 11. The commission shall have power to appoint such engineers, assistant engineers and experts, fitted by experience, to advise the commission and to conduct under its direction the surveys, and the preparation of plans, maps, calculations and estimates as may be necessary within any appropriation which may be available therefor.

§ 12. The general plan which shall be devised by the commission under the provisions of this act, shall not include any of the streams and water courses which supply the canals of the state, excepting such streams and water courses as the state engineer and surveyor and the canal board, shall state in writing, will not, if used as above provided, substantially diminish the water supply of such canals or the navigability thereof, and provided that such plan shall not include any development of water power which would effect a diversion from any of the navigable waters of this state in sufficient quantity to interfere with the navigation of such rivers or water courses.

§ 13. The sum of thirty-five thousand dollars ($35,000), or so much thereof as may be necessary, is hereby appropriated out of any funds in the treasury of the state, not otherwise appropriated, to carry out the provisions of this act, and the said moneys shall be paid by the treasurer on the warrant of the comptroller to the order of the state water supply commission when certified by that commission to be needed from time to time in carrying out the provisions of this act.

§ 14. This act shall take effect immediately.

APPENDIX C.

RULES AND REGULATIONS GOVERNING WATER SUPPLY APPLICATIONS.

APPENDIX C.

RULES AND REGULATIONS.

Adopted July 13, 1910.

Pursuant to the authority granted and the duties imposed by chapter 56 of the Laws of 1909, entitled "An act in relation to State Boards and Commissions," constituting chapter 54 of the Consolidated Laws and the acts amendatory thereof and supplementary thereto, the following Rules and Regulations have been adopted by the State Water Supply Commission, embodying an outline of the procedure before the Commission and the requirements with reference to applications and plans submitted to it for approval in connection with proposed new or additional public water supplies.

1. **Applications.**— All persons, water works corporations, municipal corporations or other civil divisions of the State, supplying or proposing to supply water to the inhabitants of any municipality or civil division of the State, and proposing to acquire lands in connection with a new or additional source or sources of water supply, shall make application to the Commission for approval of the engineering and financial plans for such acquisitions and extensions.

Such applications shall be made by verified petition in writing accompanied by exhibits and documents as hereinafter enumerated and shall be addressed to the *State Water Supply Commission, Lyon Block, Albany, N. Y.*

2. **Approval of application required.**— Before the applicant shall have authority to acquire any lands for a new or additional source of water supply the application must be approved by the Commission.

3. **Modification of petition.**— The Commission may require the petition to be modified both in substance and in form.

4. **Form of petition.**— The petition shall contain a concise statement of all facts from which the Commission may be enabled to determine whether the plans are justified by public necessity; whether they are just and equitable to other municipalties and civil divisions of the State, and whether they make proper provision for the payment of any and all damages, either direct or indirect, to persons or property, and it shall state briefly:

(a) The legal status of the petitioner, and if the petitioner is a municipality or water district, the date and chapter of the laws organizing the municipality or water district and, if a water company, the date on which and the capital with which the company was incorporated, and a reference to any statute particularly referring to the petitioner.

(b) The official capacity and the authority of the person or persons verifying the petition.

(c) The reasons for considering additional water supply at the time of application, whether on account of immediate necessity, or on account of future probable requirements, or both.

(d) A statement of the principal facts with reference to quality, quantity, water rates and fire protection afforded by the existing water supply system, if any.

(e) A statement of population affected (1) as of the last official census, (2) as estimated at present.

(f) A general statement of all available sources of supply, with particular reference to their relative availability and probable cost, sufficiency and suitability, and the reasons for the choice of the particular supply for which application is made.

(g) A statement of the assets and liabilities of the petitioner, and if a municipality, the total assessed valuation of property as indicated by the last assessment-roll.

(h) If the petitioner is a water district, a statement of its boundaries, and the total assessed valuation of property in the district.

The petition shall also contain a list of all exhibits accompanying the same, each exhibit being designated by a letter of the alphabet, which shall also be clearly written on the exhibit.

5. **Exhibits to accompany petition.**— The petition shall be accompanied by the following exhibits: (a) a general map of the proposed new system and the existing system, if any, (b) a map of the lands proposed to be acquired or occupied, (c) a section of the United States Geological Survey topographic map showing the territory and watershed affected, (d) profiles of the principal pipe lines, (e) general plans of proposed structures, (f) analyses of water samples, (g) a written report of the petitioner's engineer, (h) an estimate of the cost of establishing the proposed system and of operating expenses, and a statement of the average proposed rate to consumers, (i) a list of those who may be affected by the acquisition of the lands or the execution of the plans of the petitioner; and it shall also be accompanied by (j) a surety bond, if the applicant is a person or water works company and (k) a letter of transmission.

6. **Dimensions of maps.**— All maps, plans, profiles and other drawings submitted in connection with an application shall be on sheets not larger than 27 inches by 40 inches, or shall conveniently fold to these dimensions.

7. **General map.**— The general map shall have indicated thereon the relative position or location of the various lands, structures and works connected with the existing and proposed supply. The maps shall be to a suitable scale and shall show in general the location of lands to be acquired, reservoir and dam sites, pipe lines or aqueducts, pressure or storage tanks, purification works, distributing pipe system and location of valves and hydrants, and the elevations of all controlling points such as at the point of diversion or supply, the crests and depressions in the main pipe lines or aqueducts, and the distributing pipe system and the elevations at each of the principal street intersections in the territory to be served by the proposed supply, and such other material facts as may be of assistance in furnishing an accurate representation of the general features of the proposed system. The map shall have a title endorsed thereon in the lower right hand corner substantially in the following form:

WATER SUPPLY
VILLAGE OF BOLTON, WARREN CO., N. Y.
GENERAL MAP
EXHIBIT A TO ACCOMPANY APPLICATION
BEFORE THE
STATE WATER SUPPLY COMMISSION
July 1, 1910 Scale: 1 in. = 2000 ft.
JOHN SMITH, Engineer

8. **Land taking map.**— The land taking map shall show lands not owned by the applicant proposed to be acquired or occupied, or through which any aqueduct or pipe line is to be constructed, and shall be preferably to a scale of 100 or 200 feet to one inch and shall have indicated thereon the buildings, highways, bridges, streams and the topographic and other important features, including the boundaries of the lands proposed to be acquired and the names of the present owners. If the land indicated is for a reservoir site, the area proposed to be used for storage purposes shall have indicated thereon the surface contours of the ground in sufficient detail to enable the capacity of the proposed reservoir accurately to be determined. The map shall have a title endorsed thereon in the lower right hand corner, substantially as above noted in Rule 7, except that it shall be designated "LAND TAKING MAP."

9. **Watershed map.**— The watershed map shall consist of a sheet or sheets of the United States Geological Survey topographic maps, provided the same are available, showing the watershed or catchment territory affected.* Upon it shall be indicated the line of the divide surrounding the tributary watershed and the location of the territory to be served with water. The map shall have a title endorsed thereon in the lower right hand corner, substantially as above noted in Rule 7, except that it shall be designated "WATERSHED MAP."

10. **Profiles.**— Upon the profiles accompanying each application shall be indicated to suitable horizontal and vertical scales the relative distances and elevations on each of the principal pipe lines or aqueducts, the elevation at each crest or depression in each pipe line and the computed hydraulic gradient shall be clearly shown, and a title shall be endorsed thereon substantially as above noted in Rule 7, except that it shall be designated "PROFILES."

11. **Structural plans.**— Plans for proposed structures need be only in sufficient detail to indicate clearly the design for each of the structures proposed and sufficient information shall be indicated thereon to enable the engineer of

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* The sections of the United States Geological Survey topographic maps may be purchased from the Director of the Survey, at a uniform price of five cents per copy. Each quadrangle covers a section of the state, fifteen minutes in latitude and longitude respectively. A chart showing the sheets available in published form may be obtained by addressing

THE DIRECTOR,
U. S. Geological Survey,
Washington, D. C.

the Commission to decide upon the suitability of the designs proposed. Each plan shall have a title endorsed thereon substantially as above noted in Rule 7, except that it shall be designated "PLANS."

12. **Analyses of water samples.**— The applicant is required to furnish both a bacteriological and chemical analysis of reliable samples of the proposed water supply. To the reports of analyses shall be attached the affidavit of a responsible representative of the petitioner, setting forth the fact that the samples referred to in the report submitted were taken from the proposed source of supply and stating specifically under what conditions the samples were taken and on what date, and any other material facts with reference to such samples.

13. **Engineer's report.**— The report of the engineer who made the recommendations or designs for the proposed system shall be submitted, preferably in full, and shall contain a statement of his opinion with reference to the relative availability and cost of the several available supplies and shall state in full detail the engineering features of the proposed works. The report shall embrace a general description of the proposed system, including the location, elevation, area and capacity required or available for any proposed reservoir or tank, the character and area of the watershed tributary to the point of diversion, the general character and extent and the essential features of the design of controlling, diverting or regulating works proposed, the estimated maximum, minimum and general average static pressures within the territory proposed to be served, the number and distribution of fire hydrants, the location, extent and character of proposed purification or other works, and any other material facts. It is also desirable that detailed information be given with reference to measurements or estimates of rainfall or stream flow, and a detailed estimate of the cost of the engineering construction.

14. **Estimates of cost and statement of proposed rate.**— The estimate of cost accompanying the petition shall state in detail the various items to be included in the total cost of the delivery of water to consumers upon the completion of the work proposed. The statement of the proposed rate should give the average annual rate per 1,000 gallons, proposed to be charged to consumers upon the completion of the work.

15. **List of persons affected.**— The application shall be accompanied by a complete list of the names and addresses of all persons, companies, corporations or civil divisions of the State that, in the opinion of the petitioner, may be affected by the acquisition of lands or water rights required or the execution of the proposed plans.

16. **Surety bond.**— Individuals and water-works corporations making application are required to file with their petition an undertaking for the sum of $1,000, satisfactory to the Commission with respect to surety, as guarantee for payment of expenses of hearing and determination.

17. **Letter of transmission.**— The application shall be accompanied by a letter of transmission in which the petitioner shall state the most suitable public hall or other place available for conducting the public hearing, the names and addresses and frequency or dates of publication of all local newspapers suitable for publication of the notice of the hearing, the names and addresses of the petitioner and counsel to the petitioner, and the petitioner's engineer.

18. **Investigation by commission's engineer.**— After an examination of the maps, plans and other documents submitted in connection with an application, the Consulting Engineer to the Commission may make an investigation of the proposed source of supply at such time as the Commission may direct and submit his findings in a written report to the Commission.

19. **Notice of hearing.**— Upon the receipt and filing of a petition in proper form and other documents constituting the application, the Commission will, as soon thereafter as practicable, give public notice that on a certain day the Commission will meet at a place specified in said notice for the purpose of hearing all persons, municipal corporations or other civil divisions of the State that may be affected thereby. The notice shall be published by the petitioner in such form, in such newspapers and for such length of time, not exceeding four weeks, as the Commission shall determine.

Proof of publication of said notice shall be filed with the Commission on or before the day specified in said notice for the day of hearing.

20. **Objections.**— At any time prior to the day specified in such notice for the hearing, any person or municipal corporation or the proper authorities of any civil divisions of the State may file in the office of the Commission at Albany objections to the project proposed by the application. Every objection so filed shall be in writing and shall particularly specify the ground thereof, and no person, municipal or other corporation or civil division or their representatives shall be heard in opposition to the project proposed by such application, except on objections so filed. Amendments to the objections may be permitted by the Commission.

21. **Public hearing.**— The Commission will conduct a public hearing upon the day specified in said notice or upon a subsequent day to which the Commission may adjourn the hearing and will hear the proofs and the arguments submitted in support of or in opposition to the proposed project. The Commission may issue subpœnas.

22. **Evidence.**— At hearings the Commission requires that particular attention shall be given by the proofs and arguments to the following questions:

(1) Are the plans proposed by the application justified by public necessity?

(2) Are the plans just and equitable to the other municipal corporations and civil divisions of the State affected thereby and to the inhabitants thereof; particular consideration being given to their present and future necessities for sources of water supply?

(3) Do the plans make fair and equitable provision for the determination and payment of any and all damages to persons and property, both direct and indirect, which will result from the acquisition of said lands or the execution of said plans?

23. **Determination by commission.**— After the final hearing the Commission will proceed either:

(1) To approve such application and plans as presented, or

(2) To require such modifications in either or both the application and plans as the Commission may determine to be necessary.

(3) To reject the application entirely.

The Commission may permit a new application to be filed. The determination of the Commission will be in writing and will be filed together with all plans, maps, exhibits and other papers, records or documents relating to the application. All such records, papers and documents may be examined by any person at the office of the Commission but shall not be removed therefrom except temporarily upon the written order of the Secretary to the Commission after the filing of a receipt therefor in form prescribed by the Commission.

24. **Expense of hearing.**— The expense of the hearing and determination by the Commission will be certified by the Commission under its official seal to the person, water works corporation, municipal corporation or other civil division of the State making the application and shall be paid by the said applicant within thirty days thereafter, upon the certificate of the Commission, to the persons entitled thereto.

APPENDIX D.

DRAFT OF BILL FOR GENERAL WATER STORAGE LAW.

APPENDIX D.

DRAFT OF BILL FOR GENERAL LAW TO PROVIDE FOR CONSERVATION OF WATER RESOURCES FOR THE PUBLIC USE AND BENEFIT.

AN ACT to amend the state boards and commissions law, to provide for the general and systematic conservation, development and regulation of the water resources within the state for the use and benefit of the people of the state; defining procedure and prescribing penalties; providing for issuing bonds to an amount not exceeding twenty million dollars and for a submission of the same to the people to be voted upon at the general election to be held in the year ninteen hundred and eleven.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Article two of chapter fifty-six of the laws of nineteen hundred and nine, entitled "An act in relation to state boards and commissions, constituting chapter fifty-four of the consolidated laws," is hereby amended by adding thereto a new section, to be section four thereof, and to read as follows:

§ 4. *Definitions. The term "real estate," when used in this article, includes all uplands, lands under water, the waters of any lake, pond or stream, all water and riparian rights or privileges, all water powers, water plants, and all dams, races, sluiceways and machinery connected therewith, and any and all easements and incorporeal hereditaments, and every estate, interest and right, legal or equitable, in land or water, including terms for years, and liens, legal or equitable, on real estate, as above defined, by way of judgment, mortgage or otherwise; and all real estate, as above defined, acquired or used for railroad, highway or other public purposes.*

The term "storage reservoir," when used in this article, means a basin for impounding water, formed, enlarged or improved by the construction of a dam, and shall be construed to include the dams and dikes or other structures by means of which the water is or is to be impounded; the gatehouses, including controlling gates, sluices, screens, racks and other accessories thereto; spillways, fishways, log or ice chutes or barriers and all accessories thereto; all bridges or roadways over or appurtenant to the dams or dikes; all other structures, devices or appliances connected with or appurtenant to, any of the structures hereinbefore enumerated, in such manner that they cannot be removed without injury to such structures or without impairing the usefulness thereof for the purposes for which they are intended; the lands under the water impounded, or to be impounded by the dam or dams; and such lands surrounding or adjacent to the dam or the water impounded or to be impounded thereby, and such other real estate as shall be necessary for the purposes of the construction, maintenance or operation of a storage reservoir as above defined.

The terms "benefit" or "benefits," when used in this chapter, shall be interpreted to include the services rendered by the state under the provisions of this article to any property or municipality.

The term "water powers," when used in this article, sshall be construed to mean water power developed from falling or flowing water and all electric current and other forms of energy into which such power shall be transformed.

The words "commission" or "commissioners," when used in this article, shall mean the state water supply commission. The term "state engineer," when used in this article, shall mean the state engineer and surveyor. The term "preliminary and supervision expenses," when used in this article, shall be construed to mean expenditures, made or incurred by the state, on account of the services and expenses of its officers and employees in making studies, investigations, surveys, plans, specifications and estimates; in negotiating, drafting and letting contracts; in supervising and directing the construction, maintenance or operation of works and structures, as authorized or required by this article, and the expenses of procuring searches or abstracts of title of real property for the purposes of carrying out the provisions of this article.

§ 2. New sections are hereby added to article two of the state boards and commissions law, to be numbered consecutively, sections thirty-six to sixty-six, both inclusive, to read as follows:

§ 36. *Petition and approval when plans have been made and filed. Any person may present a petition to the commission, requesting it to recommend the building by the state of a storage reservoir, specifying the place where such storage reservoir is to be constructed, and stating the purpose or purposes for which its construction is desired. Such petition shall be accompanied with a statement of the facts and estimates showing that such reservoir when built will produce an annual net revenue to the state by the lease of the privilege of using the waters from such storage reservoir, or by the lease of power that can be generated thereby, or by assessments that can be made by reason thereof, and with a guaranty that the petitioner will pay yearly to the state a fixed sum which shall not be less than the amount mentioned in the petition as the annual gross revenue to be derived therefrom, and which sum shall be not less than the amount necessary to provide the annual contribution to the sinking fund for the payment at maturity of the bonds to be issued as herein provided, the interest on said bonds to be paid semi-annually and all charges for maintaining and operating said storage reservoirs. In case maps, plans and specifications for a storage reservoir at or near the location of the proposed storage reservoir are on file in the office of the commission and if it appears therefrom that such proposed storage reservoir will form a unit in the plan for the general and systematic conservation, development and regulation of the water resources within the state, the commission, within thirty days from the receipt of such petition, shall either approve or reject such petition and give its reasons therefor. If the commission shall approve such petition, it shall present a copy of the same with its reasons for approval and with a copy of the maps, plans, specifications and estimates to the governor, who shall within thirty days after the presentation to him of such petition and report, if he approves the same, direct the commission to proceed, in the manner herein provided, to build a storage reservoir at the place named in said petition, and as near as may be according to the maps, plans and specifications on file in the office of said commission.*

§ 37. *Petition and approval when plans have not been made; procedure. Subdivision 1.* Whenever any person shall present a petition to the commission, requesting it to recommend the building, by the state, of a storage reservoir upon any of the rivers, streams, lakes or ponds of the state, which will when completed form a unit in the adopted plan for the general and systematic conservation, development, and regulation of the water resources within the state, and which will in the opinion of the petitioners produce an annual net revenue to the state by the lease of the waters from such storage reservoir, or by the lease of power that can be generated thereby or by assessments which can be made by reason thereof, and maps, plans and specifications for which have not been made and filed by the commission, the commission shall make an investigation of the proposed storage reservoir site, and if it is satisfied that the development requested by such petitioner is feasible and one that will produce a yearly net revenue to the state and if such yearly net revenue shall be secured by proper guaranty by the petitioners, it may proceed to collect necessary information and to make the necessary borings, surveys, maps, plans and specifications for such storage reservoir and file such information, maps, plans and specifications with an estimate of the total cost of such a storage reservoir in its office, which information, maps, plans, specifications and estimates shall be open to public inspection.

Subd. 2. After such investigation, the commission shall, within thirty days from the filing of such maps, plans and specifications, either approve or reject the petition and give its reasons therefor. If the commission shall approve such petition, it shall present a copy of same, together with its reasons for approval and with copies of the maps, plans and specifications, to the governor who shall, within thirty days after the presentation of such petition to him, if he approves the same, direct the commission to proceed in the manner herein provided to build a storage reservoir at the place named in such petition and as near as may be according to the maps, plans and specifications on file in the office of said commissioners.

§ 38. *Commission to co-ordinate plans and prescribe form of petition and guaranty.* If more than one petition be presented to the commission requesting it to recommend the building by the state of a storage reservoir, specifying the same or substantially the same place or places where such storage reservoir is to be built, whether plans have been made and filed or not, the commission may approve such petitions in part or reject such petitions in part and give its reasons therefor. If the commission shall approve such petitions in part it may co-ordinate the plans of two or more petitions and present the co-ordinated plans together with its reasons for approval, and with copies of the maps, plans and specifications of the co-ordinated plan to the governor, who shall, within thirty days after the presentation of such maps, plans and specifications to him, if he approve the same direct the commission to proceed in the manner herein provided, to build the storage reservoir at the place named in such plans, and as near as may be according to the maps, plans and specifications filed by the commission. All petitions and guarantees shall comply in manner and form with rules adopted by the commission.

§ 39. *Construction without petition.* Whenever its investigations show that a storage reservoir can be built upon any of the rivers, streams, lakes or ponds of the state, which when constructed will form a unit in the plan *for the general and systematic conservation, development and regulation of the water resources within the state and when completed and operated will produce a yearly net revenue to the state, the commission may present a request to the governor for authority and direction to build such storage reservoir. Such request to the governor shall be accompanied by an estimate of the total cost of such storage reservoir, copies of maps, plans and specifications, and a report upon the project including an estimate of the nature and amount of benefits that will be conferred upon private property and municipalities situate upon such river or steam below the location of such proposed storage reservoir and the total amount of the yearly gross and net income that the state may expect to receive therefrom. The governor shall, if he approve such request, authorize and direct the commission to proceed in the manner herein provided to build a storage reservoir at the place named in said request and as near as may be according to the maps, plans and specifications on file in the office of said commission.*

§ 40. *Procedure where canal waters may be affected. Whenever any of plans to be forwarded to the governor for approval affect streams whose waters are used for canal purposes, copies of the maps, plans and other documents shall be first forwarded to the canal board, who shall within one month after the receipt examine and return same to the commission with a report upon the relation of the project to the canal waters and such recommendations, if any, as they shall consider necessary for the protection of the water supplies of the canals of the state. The commission shall then further proceed as hereinbefore specified, and shall include among the documents forwarded to the governor the report and recommendations of the canal board.*

§ 41. *Modifications of plans, how made. Any change or modification of of any such maps, plans and specifications that will increase the total cost of any such storage reservoir more than fifteen per centum above the estimates of the cost of the project as approved by the governor and on file in the office of the commission, not including land damages, must be approved by the governor.*

§ 42. *Land maps to be filed. Upon the maps specified in sections thirty-six, thirty-seven, thirty-eight and thirty-nine of this article, there shall be laid out with the names of the owners, and numbered, the various parcels of land that in the opinion of the commission will be required for building, maintaining and operating such storage reservoir, or which in its opinion may be necessary for the prosecution of the work contemplated by this article. The commission shall file in the office of the county clerk of the county wherein the same is situated, a certified copy of the maps, showing the location of such parcels of land.*

§ 43. *Acquisition of real estate; right of entry. It shall be the duty of the commission and it is hereby authorized to acquire from time to time, and in the manner hereinafter stated, in the name of and for the state, such real estate as the commission may determine to be necessary for any or all of the purposes of this article, and for such object, the commission, its engineers, employees and representatives, may enter upon any real estate for the purpose of making all surveys, measurements and observations, and for obtaining such information and data as the commission may require. The court of claims shall have jurisdiction to hear and determine claims for damages caused by such entry and to render judgment thereon.*

§ 44. *Real estate that may be acquired. The commission may enter upon and take possession of any real estate, the appropriation of which in its judgment shall be necessary for the purpose of carrying out any or all of the provisions of this article.*

§ 45. *Real estate; certified descriptions; when state deemed owner. The commission shall make a description of each parcel of the lands referred to on the maps, mentioned in section forty-two of this article, and if possible a description of any other real estate which it shall deem necessary to appropriate and which description shall be certified by the commission to be correct, and it shall indorse upon such certificate a statement that the lands and other real estate, if any, described therein have been appropriated by the state for any of the purposes of this article, and it shall file such description and certificate in the office of the secretary of state. The commission shall thereupon serve on the owner of any real estate so appropriated, a notice of the filing and the time and place of filing of such description and certificate with a description of the real estate belonging to such owner which has been so appropriated. Or the said commission may cause notice of the filing and the time and place of such filing of such description to be served on the owner of any real estate so appropriated by publishing once a week for three successive weeks in a newspaper published in each county where such real estate is situate a description of the said real estate situate in such county together with a copy of such certificate and with notice of such filing and the time and place of filing such description and certificate; and from the time of such service or the publishing of such notice, the appropriation by the state of the real estate described in such notice shall be deemed complete, and thereupon such property shall be deemed and be the property of the state. Such notice shall be conclusive evidence of an entry and appropriation by the state. The commission shall cause affidavits of such service to be recorded in the books used for recording deeds in the office of the clerk of the county where any of the real estate described therein may be situated, and the record of such notice and of such proof of service shall be evidence of the due service thereof.*

§ 46. *Acquiring title by agreement with owner. The commission may agree with the owner of any real estate so appropriated, upon the amount of compensation to be paid to such owner and for any damages resulting from such appropriation, or by the relocation or reconstruction of any railroad or highway. If any real estate of any county, town, school district or municipality is required by the state for any of the purposes of this article, the majority of the board of supervisors acting for such county, or the supervisor of any such town acting for such town, or the trustees of any school district acting for such district, or the mayor and common council of any city or president and board of trustees of any village, or other persons, boards or bodies having like power, acting for such municipality may grant or surrender such real estate for such compensation as may be agreed upon between such officers respectively and the commission, and the compensation agreed upon by the commission and such officers shall be paid by the state to the fiscal officer of the municipality or to the person from whom such real estate is purchased or acquired.*

§ 47. *Presentation of claim to the court of claims. If the commission is unable to agree with the owner for the value of the property so taken or appropriated, or on the amount of damages resulting therefrom, such owner, within one year after the service upon him of the notice of appropriation as* *above specified, may present to the court of claims a claim for the value of such land or other real estate and for such damages, and the court of claims shall have jurisdiction to hear and determine such claim and render judgment thereon. Upon filing in the office of the comptroller a certified copy of the final judgment of the court of claims, and a certificate of the attorney-general that no appeal from such judgment has been or will be taken by the state, or, if an appeal has been taken, a certified copy of the final judgment of the appellate court, affirming in whole or in part the judgment of the court of claims, the comptroller shall issue his warrant for the payment of the amount due the claimant by such judgment, with interest from the date of the judgment until the thirtieth day after the entry of such final judgment, and such amount shall be paid by the treasurer of the state.*

§ 48. *Acquiring municipal or railroad property; procedure. The commission may agree with any railroad corporation or with any town upon a line of relocation or a plan of reconstruction of any railway or upon a line of relocation or a plan of reconstruction of any highway, and may relocate or reconstruct said railway or highway according to the terms and specifications mentioned in said agreement. If the commission is unable to agree with such company or town upon a line of relocating or a plan of reconstructing such railroad or highway, said commission may relocate or reconstruct said railroad or highway upon such a line and according to such a plan as it may determine to be just and fair to said railroad company or town. Such a corporation or municipality may present to the court of claims a claim for damages, if any, by reason of reconstructing or relocating such railroad or highway and the court of claims shall have jurisdiction to hear and determine such claim and render judgment thereon. Upon filing in the office of the comptroller a certified copy of the final judgment of the court of claims, and a certificate of the attorney-general that no appeal from such judgment has been or will be taken by the state, or, if appeal has been taken, a certified copy of the official judgment of the appellate court affirming, in whole or in part, the judgment of the court of claims, the comptroller shall issue his warrant for the payment of the amount due the claimant by such judgment, with interest from the date of the judgment until the thirtieth day after the entry of such final judgment, and such amount shall be paid by the state treasurer.*

§ 49. *When costs may be awarded. If an offer is made by the said commission for the value of land appropriated, or for damages caused by such appropriation, or by the relocation or reconstruction of any highway or railroad, and such offer is not accepted, and the recovery in the court of claims exceeds the offer, the claimant is entitled to costs and disbursements as in an action in the supreme court, which shall be allowed and taxed by the court of claims and included in its judgment. If in such a case the recovery in the court of claims does not exceed the offer, costs and disbursements to be taxed shall be awarded in favor of the state against the claimant and deducted from the amount awarded to him, or if no amount is awarded, judgment shall be entered in favor of the state against the claimant for such costs and disbursements.*

§ 50. *Ascertainment and payment of liens. When a judgment for damages is rendered for the appropriation of any lands or other real estate for any of the purposes specified in this article, and it appears that there is any* *lien or incumbrance upon the property so appropriated, the amount of such lien shall be stated in the judgment, and the comptroller may deposit the amount awarded to the claimant in any bank in which moneys belonging to the state may be deposited, to the account of such judgment, to be paid and distributed to the persons entitled to the same as directed by the judgment.*

§ 51. *Work to be done by contract; advertising; deposit, et cetera. Subdivision 1. Except as hereinafter provided, all work herein specified shall be done and all material and supplies shall be procured under contracts executed in triplicate, and entered into by the commission, on the part of the state, after having been advertised once a week for four successive weeks in two newspapers published in the city of New York, one of which shall be published in the interests of engineering and contracting, and in one newspaper each in the cities of Albany, Rochester, Buffalo and Syracuse and one in each county where the particular piece of work advertised, or some portion of the same is located. The advertisement shall be limited to a brief description of the work proposed to be let, with an announcement, stating where the maps, plans and specifications are on exhibition and the terms and conditions under which bids will be received and the time and place where the same will be opened, and such other matters as may be necessary to carry out the provisions of this article, or the commission may determine are necessary. The proposals received pursuant to such advertisement shall be publicly opened and read at the time and place designated. Every proposal must be accompanied by a money deposit in the form of a draft or certified check upon some solvent state or national bank in the city of Albany or New York, payable at sight to the commission, for at least five per centum of the amount of the proposal. In case the bidder to whom such contract shall be awarded, shall fail or refuse to enter into such contract within the time fixed by the commission, such deposit shall be forfeited to the state, paid to the state treasurer and become a part of the state water storage fund. In case any bid shall be rejected, such deposit shall be returned to the bidder. In cases where the estimated cost of the materials and work does not exceed ten thousand dollars, the period of advertising may be abridged and the work may be advertised by circular letters and posters, when, in the judgment of the commission, such course may be desirable or necessary. The commission may reject any or all bids and readvertise and award the contract in the manner herein provided, whenever in its judgment the interests of the state will be served thereby.*

Subd. 2. The contract shall be in a form approved by the attorney-general, and shall be awarded to the person, firm or corporation offering to do such work at the lowest price, and who shall give adequate security for the faithful and complete performance of the contract within the sum specified in such bid, and such security shall be approved as to sufficiency by the commission, and as to form, by the attorney-general, and shall be in an amount equal to at least twenty-five per centum of the sum at which such contract was awarded. If in the judgment of the commission, the work upon any contract is not being performed according to the contract or for the best interests of the state, it shall have power to suspend the work under such contract while it is in progress, and it shall thereupon become its duty to complete the same in such manner as will accord with the contract specifications and be for the best in-

terests of the state, or the contract may be canceled and readvertised and relet in the manner above prescribed, and any excess in the cost of completing the contract beyond the price for which the same was originally awarded shall be charged to and paid by the contractor failing to perform the work. If at any time in the conduct of the work under any contract, it shall become apparent to the commission that any item in the contract will exceed in quantity the engineer's estimate by more than fifteen per centum they shall so certify to the governor and the governor shall thereupon determine whether the work in excess thereof shall be completed by the contractor under the terms and at the prices specified in the contract or whether it shall be done or finished by the commission, or whether a special contract shall be made for such excess in the manner above prescribed. Every contract shall reserve to the commission the right to suspend or cancel any contract as above provided, and to complete the same or readvertise and relet the same as it may determine, and shall also reserve to the commission the right to enter upon and complete any item of the contract which shall exceed in quantity the engineer's estimate by more than fifteen per centum or to make a special contract for such excess as it may determine.

§ 52. *Contracts, approval of. All contracts entered into by the commission for the state, pursuant to the provisions of this article, shall be subject to the approval of the governor, and when so approved, shall become binding upon the parties thereto. If any party or parties to any contract made under the provisions of this article have entered into a contract, agreement, combination or conspiracy in the form of a trust or otherwise in restraint of trade or commerce, concerning the use of any water or power provided or regulated or controlled, or in any way furnished directly or indirectly by or by reason of the construction, maintenance or operation of any storage reservoir as provided in this article, the commission shall have the right to cancel at any time any contract made under the provisions of this article. Such right of revocation may be exercised in behalf of the state by the commission and thereupon the commission shall make due assessment of the benefits received or to be received by the property affected which assessment shall be a tax upon said property.*

§ 53. *Operation of storage reservoirs; powers of commission. The commission is hereby authorized to make rules and regulations for the control, operation and maintenance of storage reservoirs, the flow of the water impounded therein to the properties benefited and such other rules and regulations as shall be necessary to carry into full force and effect the provisions of this article, and to perform any and all acts necessary to the enforcement of such rules and regulations or necessary for the purpose of carrying the provisions of this article into full force and effect.*

§ 54. *Lease of the use of water and power. For the purpose of providing a revenue for the state the said commission is hereby authorized to lease from time to time by an original lease, or by a renewal or renewals thereof to any person, association or corporation, municipal or otherwise, for terms not exceeding fifty years each, the right to use water from any storage reservoir built by the state, as herein provided, or the power that may be developed thereby. The yearly sum agreed upon to be paid to the state for the use of such water or power shall be not less than the amount specified in section thirty-six hereof, and shall be a tax upon the real estate or other property* *benefited, municipal or otherwise, and upon the property used for the development or transmission of such power, and such sum shall be a lien thereon with the same effect as taxes, assessments and levies lawfully made. A copy of the agreement made by the commission for the lease of the right to use such water or power, fixing the sum to be paid yearly by such person or corporation shall be filed by the commission with the local assessors in the assessment district wherein the property benefited, or where the power developed, is situate, and said assessors shall place the amount to be paid yearly on the asssessment-roll opposite the property benefited or used under the head of "property benefited by water storage" and such sum shall be collected in the same manner as general taxes are collected and shall be paid to the treasurer of the county, and by him paid to the state treasurer to the credit of the state water storage fund. If such agreement be made with a mupality fixing the yearly amount to be paid by it for the advantages that may accrue to it by reason of building and operating such storage reservoir, a copy thereof shall be filed with the chief fiscal officer of such municipality. The yearly sum fixed by such agreement shall thereupon become a tax upon such municipality. It shall be the duty of the officers of said municipality to raise yearly such sum of money in the manner in which the general expenses of such municipality are raised and pay the amount thereof yearly to the state treasurer, who shall deposit the same to the credit of the fund to be known as the state water storage fund.*

§ 55. Contracts with persons and municipalities as to benefits conferred. For the purpose of providing a further revenue for the state, and in consideration of benefits to be conferred, the commission is authorized to enter into a contract for a reasonable consideration with any person or corporation, municipal or otherwise, whose property is benefited by reason of building and operating a storage reservoir. The sum so agreed upon shall be a tax upon the property and municipalities benefited, to be assessed, levied and collected in the manner provided in section fifty-four of this article.

§ 56. Fixing yearly benefits. For the purpose of providing a further revenue for the state, the commission shall, after the completion of a storage reservoir, and every five years thereafter, assess the value of the yearly benefits conferred by building and operating any such storage reservoir, upon the property and upon the municipalities benefited. The yearly sum so assessed shall be a tax upon each piece of property or municipality so benefited and become a lien upon such property and municipality with the same effect as taxes lawfully assessed and levied. When the assessment is made upon private property, the commission shall file a statement of the amount of such benefits assessed by it as aforesaid with the local assessors in the assessment district wherein the property so benefited is situate, and said assessors shall place the amount to be paid yearly on the assessment-roll opposite the property benefited and under the head of "property benefited by water storage" and such sum shall be collected in the same manner as general taxes are collected, and shall be paid to the treasurer of the county and by him paid annually to the state treasurer to the credit of the state water storage fund. Where the assessment so made is upon a municipality, the commission shall file a statement of the amount so fixed by it with the chief fiscal officer of such municipality. The yearly sum so assessed by the commission against the municipality shall thereupon become a tax upon such municipality, and it

shall be the duty of the officers of such municipality to raise yearly the said sum of money in the manner in which the general expenses of such municipality are raised, and pay the amount thereof yearly to the state treasurer, who shall deposit the same to the credit of the fund known as the state water storage fund, but no tax shall be assessed under this section upon the property where the owner has entered into a contract with the commisssion to pay yearly to the state the value of the benefits conferred by water storage during the life of such contract nor upon any municipality which has entered into a like contract during the life thereof. But if the contract which the owner has entered into with such commission be for any purpose canceled by said commission, then the commission shall by due assessment assess for the benefits received by said property under the provisions of this article.

§ 57. *Report to the commission. Every person, copartnership, association or corporation, municipal or otherwise, subject to taxation for the benefits conferred by reason of the storage and control of the waters of any river, stream, lake or pond of the state as herein provided shall, within thirty days after receiving notice, make a written report to the commission containing a full description of its property, together with any information relating to the value of such benefits as may be required by said commission. The commission may, from time to time, require a further or supplemental report from any such person, copartnership, association or corporation, municipal or otherwise, containing information and data upon such matters as it may specify. Every report required by this section shall have annexed thereto the affidavit of the president, vice-president, secretary or treasurer of the association or corporation or one of the persons, or one of the members of the copartnership making the same or of the chief executive officer if it be a municipality to the effect that the statements contained therein are true. The commission may prepare blanks to be used in making the reports required by this section. Every person, copartnership, association or corporation, municipal or otherwise, failing to make the report required by this section, or failing to make any special report required by the commission within a reasonable time specified by it, shall forfeit to the people of the state the sum of one hundred dollars for every such failure and the additional sum of ten dollars for each day that such failure continues.*

§ 58. *Hearing on assessment. On making an assessment of the benefits conferred by water storage, control and regulation as herein provided, the commission shall immediately give notice in writing to each person, copartnership, association or corporation, municipal or otherwise, affected, stating in substance that such assessment has been made and the amount thereof, and that the commission will meet at its office in the city of Albany on a day specified in such notice which must not be less than twenty nor more than thirty days from the date of the notice, to hear and determine any complaint concerning such assessment. Such notice must be served at least ten days before the hearing; and it may be served on a copartnership, association or corporation, by mailing a copy thereof to it at its principal office or place of business; and on a person either personally or by mailing it to him at his place of business or last known place of residence; on a municipal corporation by mailing it to its chief executive officer. Any person, copartnership, association, or corporation, municipal or otherwise, entitled to notice under this section shall have the right to be heard and to file affidavits and other proofs* *in respect to the valuation of such benefits. Section thirty-six of chapter sixty of the consolidated laws known as the tax law, applies in so far as practicable to the hearing by the commission under this section.*

§ 59. Certiorari to review assessment. An assessment of benefits as aforesaid by the commission may be reviewed in the manner prescribed by article thirteen of chapter sixty of the consolidated laws, known as the tax law, and that article applies as far as applicable to such an assessment, in the same manner and with the same force and effect as if the assessment had been made by local assessors; a petition for a writ of certiorari to review the assessment must be presented within fifteen days after the completion and filing of the assessment-roll and the first posting of publication of notice as required by law. Such writ must run to and be answered by the commission, unless otherwise directed by the court or judge granting the writ. An adjudication made in the proceeding instituted by such writ of certiorari shall be binding upon the local assessors and any ministerial officer who performs any duty in the collection of said assessment in the same manner as though said local assessors or officers had been parties to the proceedings. The commission on filing with the city, town or village clerk, a statement of the valuation of such benefits shall give to the person, copartnership, association or corporation, municipal or otherwise, affected, written notice that such statement has been filed, and such notice may be served on the copartnership, association or corporation, municipal or otherwise, by mailing a copy thereof to it at its principal office or place of business, and on a person, either personally or by mailing it to him at his place of business or last known place of residence.

§ 60. Commission to appear by counsel. In any proceeding for the review of an assessment of benefits as aforesaid made by the commission, said commission is authorized to appear by counsel to be designated by the attorney-general. The compensation of such counsel and the necessary and proper expenses and disbursements, including all expenses of procuring evidence of experts, incurred or made by him in the defense of such proceedings, and upon any appeals therein, shall, when audited and allowed as are other charges against such tax districts, be a charge upon the tax district upon whose roll appears the assessment sought to be reviewed. Where, in one proceeding, there is reviewed the assessment of benefits to more than one tax district, separate accounts shall be rendered of such costs, expenses and disbursements to the proper officers of each of said districts and audited and allowed by them as aforesaid.

§ 61. Tax not to affect other taxes. The imposition of payment of a tax as provided in this article shall not relieve any person, assocation, copartnership or corporation, municipal or otherwise, from the payment of any other tax.

§ 62. State water storage fund. All moneys received under the provisions of this article except moneys received from the sale of bonds, issued pursuant to sections sixty-four and sixty-five hereof, shall be paid into the state treasury to the credit of the fund to be known as the state water storage fund. The sums so paid into the state treasury shall, when appropriations have been made therefor be used:

1. For paying the cost of maintaining and operating the storage reservoir from which said money was received.

2. For addition to the sinking fund to retire the bonds issued as provided in sections sixty-four and sixty-five at maturity.

3. For building other storage reservoirs or in making investigations in anticipation thereof, and

4. For deposit to the general credit of the state.

§ 63. *Employees. The commission is authorized to employ such engineers, experts, inspectors or other employees as may in its opinion be required in carrying out the provisions of this article.*

§ 64. *Bond issue. There shall be issued in the manner and at the time hereinafter specified, bonds of the state in amount not to exceed twenty million dollars, which bonds shall be sold by the state, and the proceeds thereof paid into the state treasury and so much thereof as shall be necessary shall be used for the construction of storage reservoirs, as in this article provided. Such bonds, when issued, shall be exempt from taxation.*

§ 65. *Bonds, sale of; tax, assessment and collection of. Whenever the governor shall direct the commission to build a storage reservoir as herein provided, he shall file a duplicate copy of such direction with the comptroller, and it shall be the duty of the comptroller to cause to be prepared the bonds of this state to an amount necessary to complete such storage reservoir but in no event to exceed twenty million dollars; such bonds to bear interest at a rate not exceeding four per centum per annum, which interest shall be payable semi-annually in the city of New York, at the office of some bank or trust company to be designated by the comptroller and named therein. Such bonds shall be issued for a term of not more than fifty years from their respective dates of issue, and shall not be sold for less than par. The comptroller is hereby charged with the duty of selling said bonds to the highest bidder after advertising for a period of twenty consecutive days, Sundays excepted, in at least two daily newspapers printed in the city of New York, and one in the city of Albany. Such advertisement shall contain a provision to the effect that the comptroller, in his discretion, may reject any or all bids received in pursuance of such advertisement, and in the event of such rejection, the comptroller is authorized to readvertise for bids, in the manner above provided, as many times as in his judgment may be necessary to effect a satisfactory sale. Not more than two million dollars in amount of such bonds shall be sold during the year following the date on which this chapter takes effect and thereafter such bonds shall be sold in lots not exceeding one million dollars at a time, as the same may be required for the purpose of making partial or final payments on work contracted for in accordance with the provisions of this article, and for other payments lawfully to be made under the provisions hereof. There is hereby imposed for each year after this act takes effect, and until all the bonds issued under the authority of this article shall be due, an annual tax of twelve one-thousandths of a mill upon each dollar of valuation of the real and personal property in this state subject to taxation, for each and every one million dollar or part thereof in par value of such bonds, issued and outstanding in any of said fiscal years, the annual amount of such tax to be computed by the comptroller, which taxes shall be assessed, levied and collected by the annual assessment and collection of taxes in each of such years in the manner prescribed by law and shall be paid by the several county treasurers into the treasury of the state, and the proceeds of such tax, after paying the interest due upon the outstanding bonds, shall be* *invested by the comptroller, and, together with the interest arising therefrom, shall be devoted to the sinking fund which is hereby created, payment from which shall only be made to the extinguishment of the indebtedness created by the sale of the aforesaid bonds as the said bonds become due and for no other purpose whatever. Whenever the sinking fund herein created becomes equal to the amount of the outstanding bonds, no further direct tax shall be levied on account of said sinking fund, and said tax shall be reduced to an amount equal to the accruing interest.*

§ 66. *Effect of this article. Nothing in this article contained shall be deemed or construed to grant or confirm to any person or corporation any right or privilege claimed by any person or corporation, nor shall it be deemed or construed to impair or lessen any right or power now belonging to the people of the state.*

No private property or right, perpetual or limited, shall be deemed or construed as extended or confirmed by the provisions of this article. Whenever real estate has been, now is, or hereafter shall be used for any private purpose under any franchise, grant, lease or license from or under authority of this state, expressed or implied, which may be revocable by the state or under its authority, or whenever such real estate now is or hereafter shall be used by the sufferance of the state, the commission shall have the right for and in behalf of the state to cancel and revoke such franchise, grant, lease, license or any right arising from the sufferance of the state, and when the commission shall cancel the said franchise, grant, lease, license or right arising from the sufferance of the state, the said franchise, grant, lease, license and rights arising from sufferance shall thereupon cease and be of no further force and effect.

§ 3. Sections thirty and thirty-one of article three of the state boards and commissions law are hereby renumbered sections seventy and seventy-one, respectively.

§ 4. Sections forty, forty-one, forty-two and forty-three of article four of the state boards and commissions law are hereby renumbered sections eighty, eighty-one, eighty-two and eighty-three, respectively.

§ 5. Section fifty of article five of the state boards and commissions law is hereby renumbered section ninety.

§ 6. Sections fifty-five and fifty-six of article six of said act are hereby renumbered sections one hundred and one hundred and one.

§ 7. The schedule of section head notes at the beginning of each of said articles two, three, four, five and six of the state boards and commissions law is hereby amended to correspond to the numbering and head notes of the sections in each such articles, respectively.

§ 8. Chapter to be submitted to vote. This act shall take effect when it shall have been submitted to the people at a general election and shall have received a majority of all the votes cast for and against it at such election; and the same shall be submitted to the people of this state at the general election to be held in November, nineteen hundred and eleven. The ballots to be furnished for the use of voters upon the submission of this law shall be in the form prescribed by the election law and the proposition or question to be submitted shall be printed thereon in substantially the following form, namely: "Shall chapter (here insert the number of this chapter) of the laws of nineteen hundred and ten, entitled 'An act to amend the state boards and commissions law to provide for the general and systematic conservation, development and regulation of the water resources of the state for the use and benefit of the people of the state; defining procedure and prescribing penalties; providing for issuing bonds to an amount not exceeding twenty million dollars and for a submission of the same to the people to be voted upon at the general election to be held in the year nineteen hundred and eleven,' be approved."

APPENDIX E.

PROGRESS REPORT ON HYDROGRAPHIC WORK CARRIED ON IN COOPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY.

By C. C. Covert, District Engineer, U. S. Geological Survey.

APPENDIX E.

PROGRESS REPORT ON HYDROGRAPHIC WORK CARRIED ON IN CO-OPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY.

LETTER OF TRANSMISSAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
WATER RESOURCES BRANCH.

ALBANY, N. Y., *January* 23, 1911.

HON. HENRY H. PERSONS, *President, State Water Supply Commission of New York, Albany, N. Y.:*

DEAR SIR.— I have the honor to hand you herewith my report on the hydrographic work carried on in co-operation with the Commission during 1910.

I have been assisted in this work by Mr. W. G. Hoyt, Mr. John J. Phelan, Mr. F. J. Shuttleworth, Junior Engineers, U. S. Geological Survey, and Mr. W. A. James, Computor.

Special acknowledgment is made of the very efficient manner in which your consulting engineer, Mr. Walter McCulloh, has represented the Commission and the assistance rendered by your secretary and members of the engineering force.

Acknowledgments are due the officials of the State Engineer's department for assistance in the maintenance of stations on the Raquette, Oswegatchie, and other streams and the use of other data collected.

Acknowledgments are also due to the officers of the United States Weather Bureau for climatoligical data, also to the power companies and individuals who have furnished data herein contained.

Very truly yours,

C. C. COVERT,
District Engineer.

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PROGRESS REPORT ON THE CO-OPERATIVE HYDROGRAPHIC WORK.

INTRODUCTION.

Perhaps no work carried on by the Water Supply Commission has any greater bearing on the future development of the State and the final solution of the storage problems considered in the Commission's report than has the accumulation of stream flow data which was begun by the State under an Act which became a law April 13, 1900. This Act provided $1,000 for co-operation of the State Engineer with the U. S. Geological Survey for the purpose of "the measurements of volume of streams and flow of water in the State of New York." Subsequent Legislatures have increased the amount to $1,500 per year, which sum has been equaled or exceeded each year by the survey with the exception of 1906, when the reduced Federal appropriations forbade any allotment for New York, and resulted in the transfer of the district office from Utica, N. Y., to Boston, Mass.

Co-operation with the State Engineer was renewed in 1907, and the Fuller law enacted that year made it necessary for the Water Supply Commission to obtain additional stream flow data. A co-operative agreement with the director of the U. S. Geological Survey was arranged which resulted in the establishment of a number of new stations.

Prior to March 1, 1909, it was impossible for the Federal Government to make any allotment for co-operative work with the Commission and the chief advantages of the co-operative agreement, to the State, were the services of an organization already trained in the collection of stream flow data and records that would be comparable with those obtained in other parts of the United States.

March 1, 1909, the U. S. Geological Survey re-established a New York district office at Albany, transferred from Boston all the original data in connection with the New York work and made such other preparations as were possible to improve this branch of the co-operative service.

The following appropriations have been made for the work since that date:

June 1, 1909, Water Supply Commission	$3,500
July 1, 1909, U. S. Geological Survey	1,000
July 1, 1910, Water Supply Commission	10,000
July 1, 1910, U. S. Geological Survey	1,000

The appropriation of $10,000 July 1, 1910, by the Water Supply Commission was for the following purposes:

Stream gaging	$7,500
Rain fall records	1,500
Evaporation	1,000

The appropriation of $1,000 by the survey does not include all the funds diverted to New York. There is an additional allotment of $1,500 for co-operation with the State Engineer and Surveyor, as before mentioned, for the purpose of maintaining gaging stations which have been in existence for a number of years. August 1st the New England work, outside of the State of Maine, was placed under the direction of the Albany office so that now considerable data pertaining to New York and New England are on file in Albany and it is hoped that State interests will continue to the extent that the office may be continued and the efficiency of the work increased.

The larger appropriation in 1910 made it possible to materially improve the work. The scope of the stream gaging work has gradually increased from six stations in the Hudson river drainage in 1907 to twenty stations in 1910 distributed among the most important drainage basins of the State. Seven new stations were established this year. Cableway equipment is on the ground for four stations and has been erected at two. Concrete wells and shelters have been built for two recording gages and three such gages are in place — one on Sacandaga river at Hadley, one on Genesee river at St. Helena, and one on Genesee river at Rochester. It is believed that these gages will result in a considerable increase in the accuracy of the data obtained and that the results will largely determine future methods of stream gaging, not only in New York State but throughout the United States.

Records are now being obtained from fifteen rain fall stations, ten of which were established in 1910. Standard large size thermometer shelters were installed at three of the new stations and at four of the old stations that formerly were equipped with small shelters.

Except preliminary reconnoissance, practically nothing has been done concerning evaporation. It is expected that this work will be taken up in early spring and a complete station installed somewhere in the vicinity of Albany.

Following is a list of gaging stations maintained by the above co-operative agreement, except Indian Lake, which is still maintained by the State Engineer, and Mechanicville, which record is furnished complete by R. P. Bloss, engineer for West Virginia Pulp and Paper Company. Stations marked with the asterisk were previously maintained by the State Engineer in co-operation with the U. S. Geological Survey, but on account of lack of funds for that co-operation and the fact that the Water Supply Commission were making special studies in their drainage basins, the stations were transferred to the Water Supply Commission fund July 1, 1910.

The standard methods of the United States Geological Survey have been used in making gagings at these stations. The results are given below, as far as available as this time:

(1) Station description.
(2) List of current meter discharge measurements.
(3) Daily gage heights.
(4) Estimated daily discharge.
(5) Estimated monthly mean, maximum and minimum discharges.

LIST OF GAGING STATIONS MAINTAINED IN 1910.

Hudson river at North Creek, September 21, 1907–1910.

Hudson river at Thurman, September 22, 1907–1910.

Hudson river at Mechanicville, December, 1888–1910.

Indian lake reservoir at Indian Lake, July 22, 1900–1910.

Champlain canal and Glens Falls feeder.

Schroon lake at Pottersville, July 8, 1908–1910.

Schroon river at Riverbank, September 23, 1907–1910.

Sacandaga river at Wells, August 26, 1907–1910.

Sacandaga river at Northville, August 26, 1907–1910.

Sacandaga river at upper bridge, near Hadley, September 13, 1907–1910.

Sacandaga river cable station near Hadley, November 12, 1910.

Sacandaga river, Union Bag and Paper Company's mill at Hadley, September 24, 1909–1910.

West Branch Sacandaga river at Whitehouse, August 20, 1910.

Cattaraugus creek at Versailles, September 23, 1910.

Genesee river at St. Helena, August 14, 1908–1910.

Genesee river at Jones' Bridge, near Mount Morris, May 22, 1903–1906–1908–1910.

*Genesee river at Elmwood avenue, Rochester, February 9, 1904–1910.

Canaseraga creek at Dansville, July 21, 1910.

Canaseraga creek at Shakers Crossing.

Keshequa creek at Sonyea, July 22, 1910.

*Salmon river at Fox's Bridge, near Pulaski, September 5, 1900, to December 6, 1908, July 14, 1910.

Moose river at Moose River, June 5, 1900–1910.

*Oswegatchie river near Ogdensburg, May 16, 1903–1910.

Raquette river at Raquette Falls, near Coreys, August 27, 1908–1910.

Raquette river at Piercefield, August 20, 1908–1910.

*Raquette river at Massena Springs, September 21, 1903–1910.

Bog river near Tupper Lake, August 24, 1908–1910.

St. Regis river at Brasher Center, August 22, 1910.

Ausable river at Ausable Forks, August 27, 1910.

ACCURACY AND RELIABILITY OF FIELD DATA.

Practically all discharge measurements made under fair conditions are within 5 per cent. of the true discharge at the time of observation. Generally speaking, the errors in meter measurements are largely compensating; therefore the mean rating curve, when well defined, is considered much more accurate than the individual measurements.

The work is, of course, largely dependent upon the reliability of the observers. With but few exceptions the observers perform their work honestly. The observations are made twice each day — morning and evening. While these do not always give the mean height for that day, these errors also are compensating and can be considered as negligible for a period of one month, although a single day's reading may, when taken by itself, be considerably in error.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added and an accuracy column is inserted in the monthly-discharge table. The accuracy column does not apply to the maximum or minimum, nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, and knowledge of local conditions. In this column, A indicates that the mean monthly flow is probably accurate within 5 per cent.; B, within 10 per cent.; C, within 15 per cent.; D, within 25 per cent. Special conditions are covered by footnotes.

HUDSON RIVER DRAINAGE BASIN.

Description.

The principal sources of Hudson river lie in the wildest portion of the Adirondack mountains, in Essex county, northeastern New York. A number of branches, any one of which might possibly be considered the main stream, form its upper waters; but if the highest collected and permanent body of water be assumed as the true head, then the source of the Hudson becomes Lake Tear-of-the-Clouds, which lies at an elevation of 4,322 feet above tide, in the center of the triangle formed by Mount Marcy and Skylight and Gray Peaks.

The river flows rather irregularly southward until it reaches the northern boundary of Saratoga county, where it makes a sharp turn and flows eastward for about 12 miles, passing through the mountains and forming, as it cuts across the rocky strata, several falls of great height and beauty. At Sandy Hill, just below Glens Falls, it makes another abrupt turn and flows southward, continuing in this direction until it empties into New York bay.

From Lake Tear-of-the-Clouds to the mouth of the river the distance by water is probably about 300 miles. The total area drained is 13,366 square miles. The river is tidal to Troy, which is also at the head of navigation.

The headwater region is mountainous in character, is in general heavily wooded, and is dotted with numerous lakes and ponds. The rocks, belonging to the oldest formation and mainly granitic, are either bare or covered only with a layer of spruce duff, humus, and forest litter. The river emerges from the mountain region a few miles west of Glens Falls, and thence to Troy the topography is moderately rolling and the surface soil is chiefly sand. Below Troy the river follows the great depression which extends almost due north and south between New York bay and the St. Lawrence, flowing in an open valley bordered by well-cultivated lands, which rise with moderate slope from the stream. The Catskill Mountain region is reached 20 or 30 miles below Albany, and thence to the mouth of the river the immediate valley is flanked by high hills, the Highlands of Orange county and the precipitous Palisades being especially noticeable.

The fall in the upper portion of the course is very rapid, amounting to about 64 feet per mile from Lake Tear-of-the-Clouds to the mouth of North creek, a distance of about 52 miles. From the mouth of North creek to the mouth of the Sacandaga the descent is nearly 14 feet per mile, distributed among rapids which diminish in frequency as the Sacandaga is approached. In the succeeding 26 miles to Fort Edward the river descends 418 feet more, but of this 175 feet is comprised within the three abrupt pitches at Palmer, Glens, and Bakers Falls, while most of the remainder occurs in the rapids between Jessup's Landing and the oxbow above Glens Falls. Between Glens Falls and Troy nearly the entire fall of the river is utilized for the development of water power.

The tributaries of the Hudson are numerous, and many of them are large and important. Indian river, Schroon river, and the Sacandaga unite with the main stream above Glens Falls, and between the latter point and Troy it receives Batten Kill, Fish creek, Hoosic river, and the Mohawk, the latter having several important tributaries, including West and East Canada and Schoharie creeks. The tributaries below Troy include Catskill, Esopus, and Rondout creeks, and Wallkill river from the west, and Kinderhook creek, Jansen Kill, Wappinger creek, Fishkill creek, and Groton river from the east.

The mean annual precipitation on the total basin of the Hudson is probably about 43 inches. It reaches a maximum of more than 55 inches in the heights of the Adirondacks, while in the eastern portion of the drainage area in southern Vermont, the mean annual total is only about 39 inches. Conditions during the winter period vary from the extreme cold and deep snow of the Adirondacks to the areas in the southern portion of the basin which are subject to frequent winter thaws.

The flow of the Upper Hudson is controlled to some extent during the dry season by the use of Indian Lake storage reservoir, and the natural storage facilities in the Adirondack region are unsurpassed, there being a great many ponds and lakes, many of large size and fed from extensive drainage areas. Comprehensive plans for vast storage projects on the Sacandaga, Schroon, and Upper Hudson are receiving the attention of the New York State Water Supply Commission. It is probable that on the various tributaries of the Hudson an increase in storage capacity of some 75 billion cubic feet is possible, and if this were developed the Hudson would be probably the most important water-power stream in the country. While a large amount of power has been developed in the Hudson drainage area there are vast quantities as yet unutilized, and the importance of this river basin is apparent, when it is considered that in proportion to its size it contains a greater population than any other important drainage basin in the United States with the single exception of that of the Delaware river.

The longest run-off record in the Hudson river drainage basin is that obtained at Mechanicville, which extends back to 1888.

Hudson River at North Creek, N. Y.

This station is located on the steel highway bridge at North Creek. It was established, in co-operation with the New York State Water Supply Commission, September 21, 1907, to obtain general statistical and comparative data in regard to the flow of the Hudson.

North creek, a small tributary of the Hudson, enters from the right a short distance below this point.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is affected by the presence of ice. Conditions for obtaining the accurate discharge are good, and a very good rating curve has been developed. All discharge measurements are made from the bridge.

The regimen of flow of the Upper Hudson, especially during the low-water season, has been considerably affected by storage in Indian Lake reservoir. (See Indian lake at Indian Lake.)

Information in regard to this station is contained in the annual reports of the United States Geological Survey.

Discharge measurements of Hudson river at North Creek, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec. ft.*
Jan. 19....	W. G. Hoyt................	240	320	.86	3.32	(*a*)276
Feb. 16....	C. C. Covert................	252	556	1.17	4.60	(*b*)652
April 2....	W. G. Hoyt................	247	1,680	5.94	7.23	9,980
April 6....	W. G. Hoyt................	248	1,070	3.92	5.08	4,200
April 21....	W. G. Hoyt................	248	778	2.44	3.80	1,900
June 17....	Covert & Phelan............	248	668	2.12	3.48	1.420
July 12....	W. A. James................	238	480	1.37	2.62	645
Nov. 11....	F. J. Shuttleworth...........	242	530	1.58	3.01	835
Dec. 31....	F. J. Shuttleworth...........	210	440	1.26	3.02	(*c*)556

(*a*) Measurement made under complete ice cover. Gage height to top of ice, 3.35 feet; average thickness of ice, 1.3 feet.

(*b*) Measurement made under complete ice cover. Gage height to top of ice, 4.93 feet; average thickness of ice, 1.95 feet.

(*c*) Measurement made under partial ice cover. Gage height to top of ice, 3.03 feet; average thickness of ice, 1.2 feet.

Daily gage height, in feet, of Hudson River at North Creek, N. Y., for 1910.

[Gilbert Dean, observer.]

DAY.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.............	.. 3.01	.....	....	7.20	3.90	4.65	2.52	2.92	3.05	2.95	3.55	2.90
2.............	....	.....	....	7.15	4.22	4.40	2.49	2.86	3.22	2.78	3.50	2.89
3.............	....	.....	(*a*)6.3	6.25	4.52	3.98	2.45	2.88	3.15	2.69	3.50	2.95
4.............	....	.....	(*a*)6.55	5.50	5.25	3.78	2.42	3.12	3.20	2.64	3.48	2.92
5.............	....	4.41	(*a*)5.75	5.35	5.08	3.72	2.37	3.40	3.20	2.64	3.18	2.85
6.............	....	.....	(*a*)5.15	5.35	4.58	4.00	2.34	3.20	3.37	2.63	3.45	2.8
7.............	....	.....	(*a*)5.17	5.42	4.62	4.57	2.30	3.05	3.55	3.35	3.45	2.78
8.............	.. 3.12	.....	(*a*)5.19	5.72	4.52	4.79	2.30	2.82	3.62	3.28	3.25	2.98
9.............	....	.....	(*a*)5.02	4.75	5.08	4.67	2.27	2.70	3.50	3.20	3.10	3.00
10.............	....	.....	(*a*)4.78	4.20	4.28	4.37	2.24	2.80	3.42	3.24	3.0	3.00
11.............	....	.....	(*a*)4.60	4.62	4.45	4.15	2.21	3.38	3.25	3.28	2.95	3.02
12.............	....	4.52	(*a*)4.44	4.75	3.70	4.19	2.68	4.00	3.10	3.22	2.98	2.85
13.............	....	.....	(*a*)4.12	4.28	3.48	4.07	2.68	3.58	3.04	3.22	2.90	2.75
14.............	....	.....	(*a*)3.95	4.01	3.52	3.85	2.65	3.32	3.02	3.20	2.84	2.82
15.............	.. 3.12	.....	(*a*)3.85	3.00	3.35	3.72	2.60	3.00	2.98	3.12	2.79	2.87
16.............	....	4.60	(*a*)3.68	3.88	3.15	3.57	2.64	3.30	2.90	3.05	2.75	2.82
17.............	....	.....	(*a*)3.61	2.72	3.02	3.46	2.64	3.20	2.84	3.02	2.70	2.75
18.............	....	.....	(*a*)3.50	3.48	2.92	3.64	2.64	3.20	2.80	3.02	2.60	2.85
19.............	.. 3.32	4.50	(*a*)3.48	3.85	3.00	3.75	2.60	3.15	2.78	3.18	2.54	2.90
20.............	....	.....	(*a*)3.42	5.98	3.02	3.55	2.60	3.08	2.76	3.20	2.40	3.00
21.............	....	.....	(*a*)3.50	4.52	3.26	3.48	2.60	2.95	2.76	3.18	2.28	2.88
22.............	.. 4.25	.....	(*a*)3.66	3.68	3.32	3.30	2.61	2.95	2.80	3.22	2.92	2.88
23.............	....	.....	4.18	4.28	3.45	3.10	2.60	2.95	2.77	3.25	2.95	2.90
24.............	....	.....	4.18	3.38	3.35	2.98	2.60	2.90	2.75	3.30	2.95	2.90
25.............	....	.....	5.40	3.68	3.68	2.88	2.60	2.84	2.74	3.28	2.95	2.95
26.............	....	4.80	6.30	3.22	4.84	2.78	2.59	2.81	2.79	3.35	2.94	3.00
27.............	....	.....	5.90	4.90	5.45	2.75	2.56	2.80	2.85	3.60	2.98	3.15
28.............	....	.....	5.55	3.50	4.68	2.70	2.62	2.80	3.36	3.70	2.92	3.10
29.............	.. 5.01	.....	6.12	3.18	4.25	2.62	2.90	2.79	3.40	3.80	2.90	3.05
30.............	....	.....	6.82	5.42	4.05	2.55	2.85	2.76	3.15	3.72	2.91	3.02
31.............	....	.....	7.08	.....	4.28	.....	2.92	2.75	.....	3.70	.....	3.08

(*a*) Readings taken to top of ice.

NOTE.— Ice conditions prevailed January 1 to March 22; and from November 22 to December 31. Log jams during this period effect gage heights. Gage heights for June may be slightly low.

Daily discharge, in second-feet, Hudson River at North Creek, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	450	680	8,000	9,790	2,080	3,380	474	810	940	840	1,550	450
2	425	660	7,500	9,640	2,600	2,920	454	754	1,120	682	1,480	443
3	420	640	7,000	7,080	3,140	2,210	430	772	1,040	602	1,480	490
4	400	620	6,500	5,200	4,630	1,890	412	1,010	1,100	562	1,450	466
5	375	600	5,800	4,860	4,260	1,800	382	1,350	1,100	562	1,080	415
6	350	610	5,000	4,850	3,250	2,240	364	1,100	1,310	554	1,420	380
7	325	615	4,300	5,020	3,330	3,230	340	940	1,550	1,280	1,420	360
8	300	620	3,700	5,730	3,140	3,660	340	718	1,650	1,200	1,160	514
9	300	625	3,300	3,580	4,260	3,420	325	610	1,480	1,100	990	530
10	300	630	2,800	2,570	2,710	2,870	310	700	1,380	1,150	890	530
11	300	635	2,500	3,330	3,010	2,480	295	1,320	1,160	1,200	840	548
12	300	642	2,300	3,580	1,770	2,550	594	2,240	990	1,120	870	415
13	300	644	2,100	2,710	1,350	2,350	594	1,590	930	1,120	790	350
14	300	646	2,000	2,260	1,500	2,000	570	1,250	910	1,100	736	394
15	300	648	1,800	890	1,280	1,800	530	890	870	1,010	691	429
16	300	652	1,700	2,050	1,040	1,580	562	1,220	790	940	655	394
17	290	640	1,600	628	910	1,430	562	1,100	736	910	610	350
18	280	630	1,600	1,450	810	1,680	562	1,100	700	910	530	415
19	275	620	1,600	2,000	890	1,840	530	1,040	682	1,080	488	450
20	400	620	1,600	6,380	910	1,550	530	970	664	1,100	400	530
21	800	640	1,600	3,140	1,170	1,450	530	840	664	1,080	330	436
22	3,400	660	1,900	1,740	1,250	1,220	538	840	700	1,120	466	436
23	5,400	680	2,540	2,710	1,420	990	530	840	673	1,160	490	450
24	4,800	700	2,540	1,320	1,280	870	530	790	655	1,220	490	450
25	4,200	720	5,200	1,740	1,740	772	530	736	646	1,200	490	490
26	3,200	737	7,220	1,120	3,760	682	523	709	691	1,280	482	530
27	2,400	900	6,180	3,880	5,080	655	502	700	735	1,620	514	670
28	1,600	1,240	5,320	1,480	3,440	610	546	700	1,300	1,770	466	620
29	1,050	.....	6,740	1,080	2,660	546	790	691	1,350	1,920	450	575
30	800	.....	8,650	5,020	2,320	495	745	664	1,040	1,800	458	548
31	700	.....	9,430	.....	2,710	.....	810	655	.....	1,770	.....	602

[a] NOTE.— Daily discharge during frozen periods determined on the basis measurements made under ice conditions, climatological reports and intercomparison with the discharge obtained at other stations. A well defined rating has been developed for open water period.

Monthly discharge of Hudson River at North Creek, N. Y., for 1910.

[Drainage area, 804 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	5,400	275	1,130	1.40	1.61	C
February	1,290	600	677	.842	.88	C
March	9,430	1,600	4,190	5.21	6.00	C
April	9,790	628	3,560	4.43	4.94	A
May	5,080	810	2,380	2.96	3.41	A
June	3,660	495	1,840	2.29	2.56	A
July	810	295	508	.632	.73	A
August	2,240	610	956	1.19	1.37	A
September	1,650	646	986	1.23	1.37	A
October	1,920	554	1,130	1.41	1.63	A
November	1,550	330	806	1.00	1.12	B
December	670	350	473	.588	.68	C
The year	9,790	275	1,550	1.93	26.30	

Hudson River at Thurman, N. Y.

This station is located at the Delaware and Hudson Railroad bridge leading from Thurman to Warrensburg, about 950 feet below the highway bridge to Warrensburg, and some 2,000 feet below the entrance of Schroon river into the Hudson. It was established, in co-operation with the New York State Water Supply Commission, September 22, 1907, to obtain general statistical and comparative data regarding the flow of the Hudson river.

There is a dam on Schroon river at Warrensburg, about three miles above the station. On the Hudson there is a dam at Luzerne about twelve miles below. During the winter months the discharge is affected by ice, and the station discontinued.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. Conditions for obtaining accurate discharge data are excellent, and a very good rating curve has been developed. All measurements are made from the bridge.

The regimen of flow of the Upper Hudson, especially during the low-water season, has been considerably affected by storage in Indian Lake reservoir.

Information in regard to this station is contained in the annual reports of the State Water Supply Commission of New York.

Observation at this station discontinued November 30, 1910.

Discharge measurements of Hudson River at Thurman, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 1	W. G. Hoyt	312	2,050	7.42	7.14	15,200
April 2	W. G. Hoyt	315	2,120	7.26	7.28	15,400
April 5	W. G. Hoyt	308	1,580	5.89	5.69	9,300
April 21	W. G. Hoyt	284	1,200	3.82	4.21	4,580
April 21	W. G. Hoyt	293	1,280	3.78	4.30	4,850
June 16	Covert and Phelan	279	1,050	3.01	3.76	3,270
Aug. 7	Phelan and Carman	261	789	1.68	2.80	1,330
Nov. 1	J. J. Phelan	270	881	2.21	3.23	1,950

Daily gage height, in feet, of Hudson River at Thurman, N. Y., for 1910.
[S. H. Spencer, observer.]

DAY.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	7.25	4.02	4.76	2.78	2.60	2.71	2.85	3.22
2	.....	7.37	4.63	4.60	2.49	2.66	2.91	2.69	3.17
3	.....	6.52	3.72	4.30	2.36	2.46	2.92	2.73	3.18
4	.....	6.05	4.35	4.10	2.34	2.85	2.89	2.64	3.19
5	.....	5.98	4.23	3.94	2.69	3.03	2.97	2.65	3.26
6	.....	5.42	4.51	4.34	2.59	2.89	3.00	2.56	3.34
7	.....	5.71	4.24	4.75	2.56	2.70	3.14	3.00	3.30
8	.....	5.90	4.50	4.79	2.52	2.62	3.34	2.96	3.21
9	.....	5.16	4.25	4.70	2.37	2.48	3.13	2.94	3.56
10	.....	4.72	4.37	4.66	2.28	2.38	3.08	3.01	3.02
11	.....	4.27	4.34	4.37	2.35	2.64	2.93	2.99	2.92
12	.....	4.61	3.88	4.38	2.33	3.38	2.90	2.91	2.87
13	.....	4.31	3.67	4.27	2.57	3.19	2.82	2.95	2.76
14	.....	3.74	3.67	4.07	2.49	3.75	2.75	2.97	2.75
15	.....	3.89	3.64	3.91	2.46	2.76	2.64	2.90	2.80
16	.....	4.09	3.38	3.73	2.35	2.86	2.57	2.78	2.78
17	.....	3.52	3.27	3.73	2.28	2.88	2.59	2.80	2.66
18	.....	3.42	3.31	3.72	2.50	2.87	2.60	2.82	2.53
19	.....	4.37	3.14	4.12	2.50	2.86	2.68	2.91	2.51
20	.....	6.00	3.08	3.68	2.48	2.69	2.56	2.95	2.48
21	.....	4.67	3.34	3.58	2.46	.....	2.56	2.94	2.41
22	.....	4.41	3.27	3.45	2.44	2.46	2.62	2.86	2.51
23	.....	4.76	3.37	3.30	2.41	2.58	2.55	2.90	2.78
24	.....	4.42	3.40	3.13	2.23	2.58	2.57	3.02	2.77
25	.....	.....	3.72	3.06	2.41	2.58	2 65	3.04	2.74
26	.....	.....	4.70	2.98	2.37	2.52	2.71	3.01	2.71
27	5.90	.....	4.69	2.95	2.30	2.46	2.76	3.27	2.72
28	5.92	.....	4.51	2.94	2.28	2.29	3.36	3.33	2.68
29	6.33	.....	4.24	2.92	2.52	2.52	3.29	3.36	2.74
30	6.85	.....	4.26	2.87	2.43	2.50	3.15	3.34	2.79
31	7.19	.....	4.60	.....	2.60	2.47	.....	3.34	.....

NOTE.— Gage heights missing April 25–30.

Daily discharge, in second-feet, of Hudson River at Thurman, N. Y., for 1910.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	15,400	4,070	6,220	1,260	1,000	1,160	1,380	2,110
2	....	15,900	5,830	5,740	864	1,080	1,490	1,130	2,010
3	....	12,500	3,280	4,860	720	829	1,510	1,200	2,030
4	....	10,600	5,000	4,290	700	1,380	1,450	1,060	2,050
5	....	10,400	4,660	3,850	1,130	1,720	1,600	1,070	2,200
6	....	8,350	5,470	4,980	988	1,450	1,660	950	2,380
7	....	9,380	4,690	6,190	950	1,140	1,940	1,660	2,290
8	....	10,100	5,440	6,310	900	1,030	2,380	1,580	2,090
9	....	7,480	4,720	6,040	730	852	1,920	1,550	2,890
10	....	6,100	5,060	5,920	643	740	1,820	1,680	1,700
11	....	4,770	4,980	5,060	710	1,060	1,530	1,640	1,510
12	....	5,770	3,690	5,090	690	2,470	1,470	1,490	1,420
13	....	4,890	3,160	4,770	962	2,050	1,330	1,560	1,230
14	....	3,330	3,160	4,210	864	3,360	1,220	1,600	1,220
15	....	3 710	3,090	3,770	829	1,230	1,060	1,470	1,300
16	....	4,260	2,470	3,300	710	1,400	962	1,260	1,260
17	....	2,800	2,220	3,300	643	1,440	988	1,300	1,080
18	....	2,570	2,310	3,280	875	1,420	1,000	1,330	912
19	....	5,060	1,940	4,350	875	1,400	1,110	1,490	888
20	....	10,500	1,820	3,180	852	1,130	950	1,560	852
21	....	5,950	2,380	2,940	829	980	950	1,550	772
22	....	5,180	2,220	2,640	806	829	1,030	1,400	888
23	....	6,220	2,450	2,290	772	975	938	1,470	1,260
24	....	5,210	2,520	1,920	600	975	962	1,700	1,250
25	....	5,040	3,280	1,780	772	975	1,070	1,740	1,200
26	....	4,870	6,040	1,620	730	900	1,160	1,680	1,160
27	10,100	4,710	6,010	1,560	660	829	1,230	2,220	1,170
28	10,200	4,550	5,470	1,550	643	652	2,430	2,360	1,110
29	11,700	4,390	4,690	1,510	900	900	2,270	2,430	1,200
30	13,800	4,230	4,740	1,420	794	875	1,960	2,380	1,280
31	15,200	....	5,740	......	1,000	840	......	2,380	.....

Monthly discharge of Hudson River at Thurman, N. Y., for 1910.
[Drainage area, 1,550 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	....	....	(1,650)	(1.06)	(1.22)	C
February	....	....	(1,300)	(.839)	(.87)	C
March	....	....	(7,600)	(4.90)	(5.65)	C
April	15,900	2,570	6,810	4.39	4.90	A
May	6,040	1,820	3,950	2.55	2.94	A
June	6,310	1,420	3,800	2.45	2.73	A
July	1,260	600	819	.528	.61	A
August	3,360	652	1,220	.787	.91	A
September	2,430	938	1,420	.916	1.02	A
October	2,430	950	1,590	1.03	1.19	A
November	2,890	772	1,490	.961	1.07	A
December	....	....	(860)	(.555)	(.64)	C
The year	15,900	600	2,710	1.75	23.75	

NOTE.— Discharge during frozen period, January, February, March and December, 1910, was determined on the basis of the combined flow of the Hudson river at North Creek and the Schroon river at Riverbank plus an estimated inflow.

Hudson River at West Virginia Pulp and Paper Company's Mill, Mechanicville, N. Y.

A record of the flow of Hudson river at Mechanicville has been kept at the Duncan dam since December, 1888. The record includes two daily readings of the depth on the crest of the dam, and a continuous record of the run of the water-wheels in the adjoining paper mill. During the summer of 1909 a self-recording gage was established at this station for the purpose of more accurately registering the daily flow over the crest of the dam. The accompanying tables, computed by Mr. Bloss, the engineer of the West Virginia Pulp and Paper Company, show the daily and monthly mean flow at Mechanicville.

The dam at Mechanicville was raised during 1904, a concrete crest and apron being added, so that the dam has now a rounded or ogee section. A discharge curve has been calculated, using co-efficients of discharge derived from United States Geological Survey experiments on models of dams of ogee cross-section.

The discharge of the Hudson at Mechanicville is diminished somewhat by water required in operating the Champlain canal.

Records at this station are under careful supervision and are regarded as good.

In using these records for comparisons it should be borne in mind that there is a diversion into the Champlain canal at this point. An account of this diversion may be found in this report under Champlan Canal.

Discharge measurements of Hudson River at Mechanicville, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 9	C. C. Covert	475	6,550	3.35	4.08	22,000
June 1	W. G. Hoyt	474	5,920	2.92	2.63	17,300
June 14	Covert and Phelan	476	5,610	2.44	2.14	13,700
July 22	J. J. Phelan	443	4,560	.268	.06	1,700
Aug. 13	J. J. Phelan	430	4,930	.59	1.02	2,900
Sept. 27	J. J. Phelan	472	5,010	.42	.68	2,130
Dec. 2	J. J. Phelan	464	4,960	.60	1.00	2,970

NOTE.— Measurements are made from toll bridge below Duncan Dam. Construction work in connection with the Barge Canal has affected conditions somewhat. Measurements represent flow at the time of making.

Daily discharge, in second-feet, of Hudson River at Mechanicville, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,533	5,570	31,537	35,906	15,760	14,750	3,615	2,625	1,370	4,395	3,885	2,943
2	1,331	4,247	30,930	36,054	11,459	14,665	3,588	1,562	1,238	3.224	3,453	2,467
3	1,369	4,293	29,683	37,809	11,422	12,967	700	1,646	1,490	3,698	3,582	2,288
4	804	4,258	29,988	29,819	9,715	11,628	1,284	1,459	809	2,880	3,667	2,194
5	925	3,904	28,355	25,540	12,996	8,173	2,979	2,333	1,488	2,274	4,059	2,499
6	1,745	2,550	25,211	23,072	12,485	14,025	2,640	2,402	2,658	2,314	3,477	1,668
7	2,806	4,915	28,962	23,409	11,353	16,010	2,255	2,425	2,807	2,281	6,071	2,190
8	2,163	3,814	29,088	23,808	9,367	17,227	1,949	3,365	2,685	1,533	5,082	1,805
9	1,982	3,345	24,586	23,659	11,015	16,959	1,742	2,355	2,899	1,664	4,513	1,745
10	1,928	2,742	22,302	17,722	9,227	15,728	812	1,796	3,261	2,770	4,394	1,834
11	1,883	2,745	19,691	16,128	9,563	14,300	1,631	2,498	3,400	3,557	3,692	544
12	1,489	3,106	18,559	13,510	8,527	14,028	1,421	1,748	3,500	2,027	3,598	1,552
13	1,528	3,170	15,818	14,426	7,355	14,848	1,464	2,993	2,134	2,896	2,310	1,240
14	1,864	5,765	17,295	12,555	6,176	12,791	1,463	2,658	2,393	2,692	4,403	1,260
15	1,866	3,344	14,250	9,997	4,534	11,450	1,430	2,758	2,717	2,702	3,202	1,468
16	2.134	3,858	12,778	9,429	7,166	9,759	1,385	2,061	2,701	1,378	2,570	1,448
17	1,433	3,156	11,774	8,469	5,696	8,896	800	2,097	2,075	2,725	2,919	1,780
18	1,720	4,032	10,603	8,014	5,228	9,046	1,595	2,165	345	2,388	3,013	1,129
19	2,638	3,381	9,193	8,830	5,008	8,827	1,394	2,555	2,080	1,765	2,130	1,466
20	4,583	2,483	9,684	13,313	4,795	9,760	1,328	2,527	1,766	1,926	1,180	1,780
21	2,733	3,577	12,197	18,413	5,345	7,546	1,332	796	1,604	1,242	2,533	1,376
22	31,151	5,528	12,314	14,457	5,450	6,761	1,412	1,874	1,595	1,542	2,370	1,725
23	15,692	6,002	12,622	12,279	7,341	6,078	1,465	2,389	1,429	900	2,159	1,432
24	12,370	5,227	14,714	12,885	6,312	5,425	530	1,488	1,541	1,846	2,523	1,492
25	11,513	5,276	16,946	11,827	6,681	4,872	1,382	1,185	1,036	3,548	2,098	764
26	11,644	4,694	27,319	10,360	9,397	3,283	1,395	1,629	1,987	2,800	4,771	3,234
27	8,514	10,742	28,173	16,735	13,668	5,064	1,473	2,212	1,537	2,584	2,181	2,555
28	8,295	37,655	28,924	16,363	13,964	3,825	1,406	867	2,744	3,335	2,799	3,191
29	7,358	......	27,375	13,283	11,823	3,539	1,701	867	4,737	2,471	3,712	3,791
30	6,822	......	29,529	11,221	12,297	3,064	1,410	1,180	6,143	3,152	2,069	3,746
31	7,135	......	33,162	......	14,981	......	717	1,243	......	4,289	......	3,601

Monthly discharge of Hudson River at Mechanicville, N. Y., for 1910.

[Drainage area, 4,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.
	Maximum.	Minimum.	Mean.	Per square mile.	
January	31,200	804	5,190	1.15	1.33
February	37,700	2,480	5,480	1.22	1.27
March	33,200	9,190	21,400	4.76	5.49
April	37,800	8,020	17,600	3.91	4.36
May	15,800	4,540	9,230	2.05	2.36
June	17,200	3,060	10,200	2.27	2.53
July	3,620	530	1,600	.356	.41
August	3,360	867	1,990	.442	.51
September	6,143	345	2,270	.504	.56
October	4,395	900	2,530	.562	.65
November	6,071	1,180	3,280	.740	.83
December	3,791	544	2,010	.447	.52
The year	37,700	345	6,900	1.53	20.82

Indian Lake Reservoir at Indian Lake, N. Y.

This station is located at a masonry storage dam at the outlet of Indian lake. It was established July 22, 1900, to determine the total outflow from this reservoir. The drainage area at this point is 131 square miles, including about 9.3 square miles of water surface of Indian lake at the elevation of the spillway of the dam.

The flow of the Upper Hudson has been controlled to a considerable extent during the dry season by the use of Indian Lake reservoir, since its completion in 1899. The total storage provided is about 4.7 billion cubic feet, which affords a discharge of nearly 600 second-feet for a period of 90 to 130 days each year.

The record of this station includes the elevation of the water surface in the reservoir, the depth of water flowing over the spillway or flashboards, the depth of opening and the head on the main and subsidiary logways, and the depth of the opening and the effective head on each of the five-foot sluice gates. A meterological station has also been established at the dam by the United States Weather Bureau, and records are kept of the rainfall, temperature, etc.

The crest of the dam is 106.65 feet long in the clear. To facilitate the calculation of discharge over the spillway, a series of experiments was made at Cornell University in 1899 on a full-sized model of the spillway section, 6.58 feet long, from which the co-efficient of discharge has been determined.

No computations of discharge have been made pending some current meter measurements to rate discharge through gates, and at present the record of reservoir level alone is available.

The datum of the gage has remained the same during the maintenance of the station. The elevation of the spillway crest above mean tide is 1,650 feet.

The maximum gage height of Indian Lake reservoir since the establishment of this station occurred April 27, 1908, and was 37 feet. The minimum gage height was 2 feet and occurred from March 9 to 18, 1907.

Information in regard to this station is contained in the annual reports of the United States Geological Survey, and of the State Engineer and Surveyor, State of New York.

The station is maintained in co-operation with the State Engineer and Surveyor.

Daily gage height, in feet, of Indian Lake at Indian Lake, N. Y., for 1910.

[Lester Severie, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov	Dec.
1........	2.17	6.25	6.17	21.00	30.96	34.75	34.29	30.79	27.92	23.46	16.83	16.08
2........	2.08	6.42	7.83	21.79	31.13	34.79	34.25	30.58	27.67	23.54	16.67	15.92
3........	2.00	6.54	9.08	22.42	31.46	34.75	34.25	30.38	27.42	23.67	16.50	15.75
4........	2.00	6.62	9.83	23.00	31.88	34.71	34.21	30.62	27.17	23.79	16.50	15.58
5........	2.00	6.75	10.42	23.42	32.25	34.71	34.12	30.67	26.92	23.88	16.62	15.42
6........	2.00	6.88	10.75	23.92	32.38	34.88	34.12	30.62	26.75	23.71	16.79	15.25
7........	2.00	7.00	11.08	24.33	32.50	35.08	34.00	30.71	26.58	23.54	16.88	15.04
8........	2.00	6.96	11.54	24.67	32.63	35.21	33.96	30.79	26.42	23.46	17.04	14.75
9........	2.00	6.88	12.21	25.00	32.71	35.21	33.92	30.83	26.17	23.29	17.17	14.58
10........	2.00	6.66	12.58	25.13	32.79	35.17	33.88	30.75	25.92	23.08	17.25	14.46
11........	2.00	6.46	12.75	25.33	32.92	35.13	33.83	30.83	25.67	22.83	17.33	14.33
12........	2.00	6.25	12.92	25.50	33.00	35.17	33.67	30.92	25.38	22.58	17.42	14.21
13........	2.00	6.08	13.08	25.63	33.08	35.17	33.42	31.00	25.25	22.38	17.50	14.04
14........	2.00	5.88	13.25	25.75	33.13	35.08	33.29	31.08	25.00	22.17	17.58	13.88
15........	2.00	5.66	13.42	25.88	33.17	35.04	33.17	31.17	24.75	22.00	17.67	13.71
16........	2.00	5.50	13.62	26.13	33.21	35.00	33.04	31.21	24.50	21.83	17.75	13.54
17........	2.00	5.29	13.79	26.25	33.25	34.92	32.92	31.08	24.25	21.67	17.83	13.38
18........	2.08	5.08	13.92	26.50	33.33	35.00	32.79	30.83	24.04	21.42	17.92	13.21
19........	2.17	4.88	13.04	27.67	33.46	35.00	32.67	30.67	23.88	21.08	18.00	13.04
20........	2.17	4.67	14.00	28.42	33.58	35.00	32.54	30.50	23.75	20.75	18.04	12.88
21........	2.29	4.46	14.08	28.92	33.67	34.92	32.42	30.29	23.54	20.42	17.96	12.71
22........	2.62	4.25	14.20	29.25	33.83	34.83	32.29	30.08	23.38	20.08	17.75	12.54
23........	2.96	4.04	14.38	29.42	33.92	34.75	32.17	29.88	23.17	19.75	17.54	12.38
24........	3.79	3.83	14.54	29.54	34.00	34.67	32.04	29.62	22.96	19.42	17.38	12.21
25........	4.75	3.62	15.17	29.67	34.17	34.58	31.92	29.42	22.75	19.08	17.21	12.08
26........	5.16	3.42	16.00	30.00	34.46	34.50	31.79	29.21	22.75	18.75	17.04	11.96
27........	5.42	3.50	16.67	30.33	34.58	34.42	31.67	29.00	22.75	18.42	16.88	11.83
28........	5.58	4.67	17.25	30.50	34.58	34.38	31.50	28.79	22.96	18.17	16.67	11.71
29........	5.75	.....	18.00	30.67	34.58	34.33	31.33	28.58	23.17	17.83	16.46	11.58
30........	5.92	.....	18.83	30.83	34.58	34.33	31.17	28.46	23.38	17.50	16.25	11.46
31........	6.08	.....	20.00	......	34.71	......	31.00	28.21	......	17.17	......	11.33

Gate openings, in feet, of Indian Lake Reservoir at Indian Lake, N. Y., for 1910.

DATE.	Sluice gate A open.	Sluice gate B open.
	Feet.	*Feet.*
January 1 to February 28	5.0	....
July 1 to July 11	2.6	....
August 1 to August 4	5.0	....
August 5–6	2.0	....
August 9–10	5.0	....
August 11	2.0	....
August 16	2.0	....
August 17 to September 27*a*	5.0	....
October 5 to November 1	....	5.0
October 18 to November 3	2.6	....
November 2–3	....	2.0
December 5–10	2.6	....
December 1–31	....	5.0

a Main logway open about 9 feet August 31 to September 20, and open 15 feet September 21 to 30

Champlain Canal and Glens Falls Feeder, N. Y.

The discharge of Hudson river at both Fort Edward and Mechanicville is diminished somewhat by the water required for operating the Champlain canal. In the northern portion of this canal — from Northumberland to Lake Champlain, at Whitehall — the summit level (between Fort Edward and Fort Ann) is supplied (1) by the Glens Falls feeder, a branch canal, leaving the Hudson about 2 miles above Glens Falls, and (2) by Wood creek.

At Northumberland the canal crosses the Hudson and the southern portion receives its principal water supply here.

The quantity of water diverted from Hudson river for the Champlain canal has been measured occasionally during 1910 at various points and a summary of these measurements follows:

Measurements of flow in Champlain Canal, Glens Falls Feeder and spillways in 1910.

No.	Date.	LOCALITY.	Mean veloc. (ft. per second)	Discharge (second feet).	Remarks.
		Below Northumberland.			
1	June 2	Champlain Canal at Mechanicville	0.38	91.2	....
2	June 2	Spillway near Mechanicville	......	3	Estimated.
3	June 2	Bridge 34, Stillwater	.60	115	....
4	June 2	Spillway below bridge 34	......	7	Estimated.
5	June 2	Schuyler Creek near Stillwater	.33	39	....
6	June 2	Spillway at Bemis	......	5	Estimated.
7	June 2	Bridge 45 below Coveville	.62	170	....
11	June 3	Coveville foot bridge	.48	127	....
9	June 3	Spillway below Coveville	......	5	Estimated.
12	June 3	Champlain Canal, Schuylerville	.54	183	....
	June 3	Spillway below Schuylerville	......	5	Estimated.
13	June 3	Lock at head of canal	......	5	Estimated.
1	June 21	Champlain Canal at Mechanicville	.30	75.4	....
1	July 21	Champlain Canal at Mechanicville	.72	164	....
1	Aug. 13	Champlain Canal at Mechanicville	.23	60.5	....
1	Sept. 26	Champlain Canal at Mechanicville	.38	88	....
		Above Northumberland.			
14	June 3	Lock at end of Canal	......	5	Estimated.
15	June 4	Champlain Canal at Fort Edward	.42	110	....
(*a*)	June 3	Glens Falls Feeder, Hudson Falls	.97	195	....
17	June 4	Spillway above Fort Edward	......	5	Estimated.
18	June 4	Champlain Canal above Feeder Br. No. 100	.36	135	....
20	June 4	Glens Falls Feeder above Glens Falls	.87	216	....
	June 15	Champlain Canal, Maple St. Br. above Br. 100	.22	74.5	....
20	June 15	Glens Falls Feeder above Glens Falls	.75	177	....
16	Aug. 12	Glens Falls Feeder, Hudson Falls	.56	123	....
20	Aug. 12	Glens Falls Feeder, Glens Falls	.77	208	....
16	Sept. 26	Glens Falls Feeder, Hudson Falls	.79	182	....
20	Sept. 26	Glens Falls Feeder, Glens Falls	.71	190	....
16	Oct. 14	Glens Falls Feeder, Hudson Falls	.88	188	....
20	Oct. 14	Glens Falls Feeder, Glens Falls	.83	210	....

(*a*) Brown Bridge.

Descriptions of measuring points. Numbers correspond with points at which measurements have been made.

1. Made from Saratoga Street bridge.

2. This spillway is about 250 yards above mill of West Virginia Pulp Company at Mechanicville; is 90 feet across; water flowing over about ½ inch in depth.

5. Schuyler creek flows into the canal opposite the Stillwater spillway; no measurement of this could be made, but estimated flow was 10 or 15 second-feet.

6. Measurement from bridge at Stillwater.

7. Measurement from bridge No. 45, opposite W. F. Curtis's.

8. Spillway between bridges Nos. 46 and 47; not sufficient flow for measurement. Estimated at 5 to 8 second-feet.

9. Spillway just above bridge No. 51; estimated flow at 1 second-foot.

10. Small spillway 75 yards below Coveville; estimated flow 4 to 5 second-feet.

11. Measurement from footbridge behind Coveville post-office.

12. Measurement from bridge No. 63. There are three spillways just below this bridge.

13. Lock not in use at this time; estimated leakage 4 to 6 second-feet.

14. Lock at end of canal; estimated leakage 3 to 5 second-feet.

15. At East Street bridge, Fort Edward.

16. From Change bridge west of trolley line at Hudson Falls.

17. From bridge 45 feet north of entrance of Glens Falls feeder; current runs north.

18. There is but one bridge between Fort Edward and Glens Falls feeder, about 150 yards above Fort Edward lock; barely a trace of current here in canal. Estimated flow over lock gates, 10 or 12 second-feet. Between Fort Edward and Glens Falls feeder is one small waste weir; estimated flow over this 1 second-foot.

19. At plate-girder highway bridge at Glens Falls.

20. At Change bridge near feed dam, Glens Falls.

Results of discharge measurements to show diversion from Hudson river for canal purposes above Fort Edward and Mechanicville gaging stations, in 1910.

DATE OF MEASUREMENT.	FEEDER AT		CHAMPLAIN CANAL.		
	Glens Falls.	Hudson Falls.	Fort Edward.	Above Feeder.	Saratoga street, Mechanicville.
June 2, 3, 4	216	195	88	107	91
June 15-21	177	(160)	(72)	(88)	75
July 21	......	......	......	......	164
August 12-13	208	123	55	68	60.5
September 26	190	178	80	98	88
October 14	210	188	85	103	(90)
Mean of observed quantities	200	170	......	94	96

From the foregoing table it appears that an average of about 200 second-feet passes under the first change bridge on the Glens Falls feeder above Glens Falls and an average of 170 second-feet under the Ferry Street bridge at Hudson Falls. This indicates that about 30 second-feet returns to the Hudson river above Fort Edward and that about 170 second-feet enters Champlain canal and is diverted above Fort Edward. It is estimated that about 95 second-feet flows north toward Lake Champlain and is permanently diverted from the Hudson drainage. The remaining 75 second-feet flows south and probably nearly all gets back into the Hudson at or above Northumberland.

The supply of water taken for the southern part of the canal below Northumberland is probably about 95 second-feet, which with the 95 second-feet flowing north into Lake Champlain makes a total of about 190 second-feet to be added to the recorded flow at Mechanicville.

It will be noted that the gagings were made at different times of the canal season so that the usage is shown for the various periods and the average value given for the deductions.

In conclusion, it seems safe to assume, the following values as applicable during that portion of the year when the canal is in operation — May to November, inclusive.

At Fort Edward add 170 second-feet to the recorded flow.

At Mechanicville add 190 second-feet to the recorded flow.

These values are practically the same as found by Mr. Barrows in 1907, and since the measurements cover the period of operation of the canal, except for May and November, they are believed to be approximately correct; any great deviation therefrom would be temporary and due to lockage or breaks in the canal.

MISCELLANEOUS DISCHARGE MEASUREMENTS OF STREAMS IN HUDSON RIVER DRAINAGE BASIN IN 1910.

The following miscellaneous discharge measurements were made in Hudson River drainage basin in 1910:

Miscellaneous discharge measurements in Hudson River drainage basin, 1910.

DATE.	Stream.	Tributary to	Locality.	Gage height.	Discharge.
				Feet.	*Sec. ft.*
Jan. 10.	West branch Sacandaga river.........	Sacandaga river above Northville.........	Highway bridge above mouth of Devorse Creek, about 2½ miles southwest of Wells...........	....	(*a*)76.9
Aug. 23.	East Stony Creek.....	Sacandaga river near Northville.........	300 yards above highway bridge on road to Wells...........	(*b*)12.2	16.1
Aug. 23.	West Stony Creek....	Sacandaga river near Northville.........	Near highway bridge on road to Benson Center...........	(*b*)15.69	7.4
July 20.	The Branch (Niagara Brook)............	Schroon River.......	Farm crossing near White House hotel, 1 mile west of Blue Ridge.............	(*c*)5.62	12.5

(*a*) Measurements made under complete ice cover, average thickness of ice 0.8 feet

(*b*) Reference point on down stream side of bridge, distance to water surface.

(*c*) Distance to water surface from nail in maple tree (10 inches diameter) 150 feet below bridge on right bank.

SCHROON RIVER BASIN.

Description.

Schroon river rises in Essex county, along the southern slopes of the highest mountains in the Adirondack group, flows in a general southerly direction for about 45 miles through Essex and Warren counties, and joins the Hudson near Thurman. Its total drainage area is 550 square miles. Its headwaters reach an elevation of about 2,000 feet above mean tide, while at its mouth it is at an elevation of about 600 feet.

Its basin is largely forested and contains considerable wild land and numerous lakes and ponds. The most important of these is Schroon lake, through which the river flows, which has water surface area of about 6.3 square miles. The river affords excellent opportunities for storage and power development, which are under investigation by the New York State Water Supply Commission. The only power developments are at Warrensburg.

Schroon Lake at Pottersville, N. Y.

This station is located at the outlet of Schroon lake, 1 mile from Pottersville post-office, and is at the Steamboat wharf. It was established July 8, 1903, in co-operation with the U. S. Geological Survey, to obtain the fluctuations in level of Schroon lake for general statistical and comparative data. It was discontinued December 5, 1908, re-established July 1, 1909, discontinued December 4, 1909, re-established April 17, 1910, and discontinued December 3, 1910.

The gage datum was established at an elevation of 803.75 feet above mean sea level. The ice raised the gage .17 feet during the winter of 1908–1909. A plus correction of .17 feet has been applied to the 1910 readings to make them conform with original gage datum.

Daily gage height in feet of Schroon Lake at Pottersville, N. Y., for 1910.
[Asel Galusha, observer.]

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov	Dec.
1	......	4.26	5.37	2.87	1.87	2.67	1.97	1.27	1.07
2	......	4.87	5.47	2.77	1.87	2.57	1.87	1.27	1.07
3	......	5.07	5.47	2.77	1.97	2.47	1.87	1 37	1.07
4	......	5.17	5.37	2.77	2.02	2.47	1.77	1.37	......
5	......	5.37	5.47	2.67	2.02	2.47	1.77	1.37	......
6	......	5.37	5.47	2.67	2.02	2.67	1.67	1.37	......
7	......	5.42	5.37	2.57	2.07	2.67	1.57	1.37	......
8	......	5.37	5.57	2.27	2.17	2.57	1.47	1.37	......
9	......	5.27	5.47	2.27	2.27	2.57	1.47	1.37	......
10	......	5.27	5.37	2.07	2.47	2.57	1.47	1.37	......
11	......	5.27	5.47	2.07	2.57	2.57	1.47	1.37	......
12	......	5.27	5.37	2.07	2.57	2.47	1.37	1.37	......
13	......	5.17	5.07	1.97	2.67	2.47	1.37	1.37	......
14	......	5.07	5.07	1.97	2.77	2.37	1.37	1.27	......
15	......	5.07	4.97	1.97	2.77	2.37	1.37	1.27	......
16	......	4.97	4.77	1.97	2.87	2.37	1.37	1.17	......
17	4.77	4.87	4.77	1.97	2.87	2.37	1.37	1.17	......
18	4.77	4.87	4.77	1.97	2.87	2.37	1.37	1.17	......
19	5.12	4.67	4.87	1.97	2.97	2.17	1.27	1.17	......
20	5.47	4.47	4.87	1.97	3.07	2.07	1.27	1.17	......
21	5.57	4.47	4.97	1.87	3.07	1.97	1.17	1.17	......
22	5.57	4.47	5.07	1.87	3.07	1.97	1.17	1.17	......
23	5.47	4.47	3.17	1.87	3.07	1.77	1.17	1.17	......
24	5.37	4.57	3.57	1.87	3.07	1.77	1.17	1.07	......
25	5.47	4 57	3.87	1.87	3.07	1.77	1.17	1.07	......
26	5.17	4.77	3.67	1.87	3.07	1.87	1.17	1.07	......
27	5.17	4.87	3.57	1.87	3.07	1.87	1.17	1.07	......
28	5.17	4.97	3.47	1.87	2.97	1.87	1.07	1.07	......
29	5.17	5.27	4.07	1.87	2.87	1.97	1.07	1.07	......
30	5.17	5.27	3.97	1.87	2.77	1.97	1.07	1.07	......
31	......	5.47	......	1.87	2.67	......	1.17	......	......

Schroon River at Riverbank, N. Y.

This station is located on the steel highway bridge near Riverbank post-office, between the towns of Warrensburg and Bolton, about 9 miles north of the village of Warrensburg, and about 10 miles downstream from the outlet of Schroon lake. It was established September 23, 1907, in co-operation with the U. S. Geological Survey, to obtain general statistical data in regard to the flow of Schroon river.

There are several dams at the village of Warrensburg used for power purposes. During September, 1907, a timber crib dam was constructed at Starbuckville, about 6 miles above the gaging station for storage purposes, this affording a head of some 8 feet and ponding water to Schroon lake. Tumble Head falls begin about 1 mile above the gaging station and extend upstream for about a mile further, affording a total fall of some 30 feet.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is affected by ice conditions. Conditions for obtaining accurate discharge are good, and a very good rating curve has been developed. All measurements are made from the bridge.

Since 1907, the regimen of flow of Schroon river during the low water season has been considerably affected by the storage held in Schroon lake.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Discharge measurements of Schroon River, at Riverbank, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. Ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Jan. 20......	W. G. Hoyt.................	62	138	1.01	1.73	(*a*)139
Feb. 17......	C. C. Covert...............	72	194	1.84	2.63	(*b*)358
April 1......	W. G. Hoyt.................	85	593	9.90	7.22	5,870
April 2......	W. G. Hoyt.................	85	600	9.58	7.19	5,750
April 4......	W. G. Hoyt.................	85	542	8.94	6.52	4,840
April 5......	W. G. Hoyt.................	85	508	8.64	6.21	4,390
June 16......	Covert & Phelan............	78	284	4.60	3.54	1,310
Dec. 28......	F. J. Shuttleworth...........	62	166	1.12	1.70	(*c*)186
Dec. 28......	F. J. Shuttleworth...........	102	224	1.34	2.00	(*d*)301

(*a*) Complete ice cover. Gage height to top of ice, 1.83 feet. Average thickness of ice, 1.00 feet.
(*b*) Complete ice cover. Gage height to top of ice, 2.73 feet. Average thickness of ice 1.00 feet.
(*c*) Complete ice cover. Gage height to top of ice 1.70, to bottom, 0.70; average thickness ice .88.
(*d*) Complete ice cover. Gage height to top of ice 2.00, to bottom .90; average thickness ice 1.30.

Daily gage height, in feet, of Schroon River at Riverbank, N. Y., for 1910.

[J. H. Roberts, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1......	1.6	2.45	3.20	7.22	4.25	4.72	2.75	1.35	1.95	2.20	2.15	1.85
2......	1.65	2.45	3.45	7.18	4.18	4.55	1.75	1.45	2.00	2.10	2.20	1.90
3......	1.60	2.50	3.65	6.88	4.28	4.30	1.65	1.35	2.10	2.20	2.10	1.95
4......	1.60	2.50	3.70	6.52	4.20	4.15	1.75	2.00	2.00	2.15	2.15	1.75
5......	1.55	2.45	3.70	6.18	4.28	4.05	2.58	1.60	2.00	2.15	2.30	1.80
6......	1.60	2.40	3.75	5.90	4.38	4.15	2.35	1.50	2.10	2.15	2.25	1.80
7......	1.65	2.45	3.98	5.78	4.45	4.12	2.35	1.45	2.10	2.10	2.30	1.90
8......	1.70	2.50	4.22	5.62	4.30	4.35	2.20	1.50	2.15	2.05	2.30	1.85
9......	1.75	2.50	4.50	5.45	4.35	4.35	2.20	1.50	2.10	2.00	2.30	1.90
10......	1.65	2.50	4.45	5.20	4.30	4.30	2.00	1.45	2.05	2.05	2.30	1.75
11......	1.70	2.45	4.52	4.75	4.25	4.15	2.00	1.50	1.95	2.05	2.30	1.70
12......	1.70	2.50	4.48	4.30	4.25	4.15	1.65	1.45	2.00	2.10	2.25	1.65
13......	1.75	2.60	4.38	4.45	4.20	4.00	1.70	1.40	2.10	2.05	2.15	1.50
14......	1.70	2.75	4.22	4.30	4.15	3.72	1.70	1.30	1.55	2.00	2.25	1.55
15......	1.70	2.75	4.10	4.20	3.85	3.50	1.60	1.45	1.45	2.00	2.15	1.75
16......	1.65	2.60	4.00	4.08	3.85	3.55	1.65	1.50	1.50	1.85	2.10	1.70
17......	1.70	2.70	3.90	3.98	3.72	3.50	1.50	1.45	2.00	2.10	2.15	1.65
18......	1.70	2.70	3.80	3.72	3.20	3.40	1.55	1.45	1.95	2.10	2.20	1.50
19......	2.00	2.75	3.62	3.88	3.20	3.35	1.50	1.45	1.95	2.05	2.20	1.70
20......	1.70	2.70	3.58	4.22	3.15	3.25	1.50	1.40	1.90	2.00	1.90	1.70
21......	1.65	2.65	3.52	4.65	3.22	3.20	1.45	1.40	1.85	1.90	2.10	1.65
22......	2.00	2.85	3.52	4.72	3.00	3.15	1.40	1.45	1.90	1.95	2.10	1.60
23......	2.05	2.80	3.65	4.62	3.12	3.05	1.55	1.65	1.85	1.85	2.10	1.60
24......	2.10	2.75	3.92	4.50	3.45	3.00	1.35	1.70	1.85	1.90	1.85	1.80
25......	2.20	2.80	4.50	4.48	3.50	2.90	1.40	1.65	2.05	1.95	2.00	1.70
26......	2.30	2.75	5.12	4.40	4.25	2.75	1.35	1.60	2.05	1.95	2.00	1.80
27......	2.40	3.00	5.48	4.48	4.18	2.95	1.40	1.50	2.15	1.95	1.80	1.80
28......	2.45	3.00	5.88	4.42	4.40	2.95	1.40	1.55	2.40	2.10	1.90	1.70
29......	2.40	......	5.18	4.40	4.30	3.00	1.35	1.65	2.35	2.15	1.80	1.75
30......	2.50	......	6.58	4.35	4.60	2.85	1.30	1.60	2.20	2.00	1.85	1.80
31......	2.40	......	6.95	......	4.68	......	1.20	1.80	......	2.15	......	1.90

REMARKS: Ice conditions prevailed Jan. 1–March 13, and Dec. 8-31.

Daily discharge in Second-feet Schroon River, at Riverbank, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1......	160	310	579	5,460	1,940	2,470	694	136	331	432	411	294
2......	177	310	720	5,420	1,870	2,270	259	164	350	390	432	312
3......	155	328	858	5,060	1,970	2,000	226	136	390	432	390	331
4......	153	328	912	4,620	1,890	1,840	259	350	350	411	411	259
5......	140	310	938	4,220	1,970	1,730	608	210	350	411	476	276
6......	149	297	1,000	3,880	2,080	1,840	499	178	390	411	454	276
7......	165	310	1,220	3,740	2,160	1,800	499	164	390	390	476	312
8......	168	324	1,400	3,540	2,000	2,050	432	178	411	370	476	294
9......	176	324	1,840	3,340	2,050	2,050	432	178	390	350	476	250
10......	158	324	1,860	3,040	2,000	2,000	350	164	370	370	476	205
11......	160	310	2,020	2,500	1,940	1,840	350	178	331	370	476	190
12......	157	324	2,060	2,000	1,940	1,840	226	164	350	390	454	175
13......	166	351	2,090	2,160	1,890	1,670	242	149	390	370	411	140
14......	152	396	1,910	2,000	1,840	1,400	242	122	194	350	454	150
15......	150	396	1,780	1,890	1,520	1,200	210	164	164	350	411	200
16......	144	352	1,670	1,760	1,520	1,240	226	178	178	294	390	190
17......	145	358	1,570	1,650	1,400	1,200	178	164	350	390	411	180
18......	140	381	1,470	1,400	966	1,120	194	164	331	390	432	140
19......	196	396	1,310	1,550	966	1,080	178	164	331	370	432	190
20......	139	381	1,270	1,910	933	1,000	178	149	312	350	312	190
21......	130	366	1,220	2,380	980	966	164	149	294	312	390	180
22......	165	426	1,220	2,470	836	933	149	164	312	331	390	165
23......	204	411	1,340	2,350	913	868	194	226	294	294	390	165
24......	214	396	1,590	2,220	1,160	836	136	242	294	312	294	220
25......	237	411	2,220	2,190	1,200	776	149	226	370	331	350	190
26......	262	396	2,940	2,100	1,940	694	136	210	370	331	350	220
27......	287	476	3,380	2,190	1,870	806	149	178	411	331	276	220
28......	300	476	3,870	2,130	2,100	806	149	194	522	390	312	190
29......	287	......	3,020	2,100	2,000	836	136	226	499	411	276	200
30......	312	......	4,700	2,050	2,330	748	122	210	432	350	294	220
31......	287	......	5,140	......	2,420	......	97	276	......	411	......	250

NOTE.—Ice conditions prevailed January 1–March 13, and December 8-31. The flow for this period is based on a special curve.

Monthly discharge of Schroon River at Riverbank, N. Y.. for 1910.

[Drainage area, 534 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	312	130	188	.352	.41	C
February	476	297	363	.680	.70	C
March	5,140	579	1,910	3.58	4.13	B
April	5,460	1,400	2,780	5.21	5.81	A
May	2,420	836	1,700	3.18	3.67	A
June	2,470	694	1,400	2.62	2.92	A
July	694	97	260	.487	.56	A
August	350	122	186	.348	.40	A
September	522	164	348	.652	.73	A
October	432	294	368	.689	.79	A
November	476	276	399	.747	.83	A
December	331	140	219	.410	.47	C
The year	5,460	97	843	1.58	21.42	

SACANDAGA RIVER BASIN.

Description.

Sacandaga river is formed by three principal branches which unite in the southeastern part of Hamilton county in the Adirondack region. The west branch is the outlet of Piseco lake, the middle branch is the outlet of Sacandaga and Pleasant lakes, while the east and principal branch issues from a series of small ponds and lakes in the southwestern part of Warren county. The east and middle branches unite a few miles north of Wells and are joined by the west branch a short distance below Wells. The river then flows southeasterly to about 5 miles below Northville, where it turns and runs northeasterly to the Hudson river at Hadley. Its total drainage area comprises about 1,050 square miles.

Sacandaga lake, the highest of the tributary lakes in the headwaters, is about 1,700 feet above mean tide; at its entrance into the Hudson the Sacandaga is at an elevation of about 550 feet. Between Northville and the mouth of the river there is a fall of about 180 feet (chiefly concentrated in the 5 miles below Conklingville) entirely unutilized. There are, in fact, no power developments on the Sacandaga.

The drainage area of this river is largely in forest. Precipitation is high, the mean for the year being about 49 inches, whereas that of the whole Hudson drainage area above Mechanicville is only about 43 inches. Possibilities for storage on the Sacandaga are great and the State Water Supply Commission of New York propose a high dam at Conklingville, the reservoir to store about 25,000,000,000 cubic feet of water, with a water surface of about 40 square miles, and controlling practically the entire flow of the Sacandaga basin. Their plan proposes also to develop the total fall obtained between Conklingville and the Hudson — approximately 200 feet — which will afford 25,000 to 30,000 continuous horsepower.

Sacandaga River at Wells, N. Y.

This station is located at the steel highway bridge over the east branch of the Sacandaga river in the southern part of the village of Wells, about 2½ miles above the junction of the east and west branches. It was established August 26, 1907, in co-operation with the U. S. Geological Survey, to obtain general statistical and comparative data regarding the flow of the Sacandaga river.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is usually affected by the presence of ice. Conditions for obtaining the accurate discharge are good, and a fairly good rating curve has been developed. All measurements are made from the bridge.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Discharge measurements of Sacandaga River at Wells, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec. ft.*
Jan. 9	C. C. Covert	46	95	.71	4.24	(*a*) 68
Jan. 10	C. C. Covert	46	92	.70	4.26	(*a*)64
Mar. 26	W. G. Hoyt	100	530	7.24	8.5	(*b*)3,840
Mar. 27	W. G. Hoyt	98	438	6.44	7.58	2,820
Mar. 28	W. G. Hoyt	98	428	6.66	7.55	2,850
Mar. 29	W. G. Hoyt	97	530	7.04	8.5	(*b*)3,730
April 13	C. C. Covert	90	404	3.56	7.26	(*c*)1,440
April 14	C. C. Covert	82	258	1.95	5.62	(*c*)503
June 8	W. G. Hoyt	91	351	4.79	6.54	1,680
June 9	W. G. Hoyt	89	319	4.36	6.30	1,390
July 15	J. J. Phelan	55	111	.49	3.90	55
July 21	J. J. Phelan	56	129	1.15	4.39	148
Oct. 27	W. G. Hoyt	73	172	1.44	4.75	248
Oct. 27	W. G. Hoyt	82	242	2.53	5.39	612
Oct. 28	W. G. Hoyt	80	216	2.27	5.23	490
Dec. 22	F. J. Shuttleworth	65	124	.91	4.60	(*d*)112

(*a*) Measurements made under complete ice cover. Gage height to top of ice 4.34 feet; average thickness of ice 0.8 feet.

(*b*) Poor measurements; not enough lead weights for velocities.

(*c*) Discharge affected by log jam below bridge.

(*d*) Measurement made under complete ice cover. Gage height top of ice 4.60 feet; average thickness of ice 0.8 foot.

Daily gage height in feet, of Sacandaga River at Wells, N. Y., for 1910.

[Frank Stanyon, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.12	5.32	8.48	8.92	5.90	6.98	4.35	3.92	3.95	5.30	4.78	4.38
2.....	4.12	5.65	8.25	8.55	5.85	6.78	4.36	3.90	4.00	5.12	4.74	4.38
3.....	4.14	5.56	7.65	7.78	6.00	6.58	4.29	3 92	4.15	4.95	4.78	4.38
4.....	4.15	5.50	7.12	7.52	6.05	6.51	4.22	4.75	4.68	4.84	5.02	4.38
5.....	4.18	5.35	6.85	7.62	6.00	6.58	4.19	5.20	4.62	4.72	5.50	4.58
6.....	4.22	5.90	6.70	7.52	6.00	6.90	4.10	4.70	4.70	4.72	5.48	4.90
7.....	4.24	6.00	6.75	7.40	6.00	7.20	3.90	4.35	4.58	4.65	5.45	4.98
8.....	4.25	5.85	6.45	7.05	5.90	......	4.00	4.22	4.45	4.60	5.38	4.78
9.....	4.25	5.58	6.34	6.45	5.90	6.10	3.96	4.16	4.35	4.62	5.28	4.62
10.....	4.25	5.42	6.28	6.45	5.72	5.90	3.90	4.15	4.24	4.58	5.22	4.58
11.....	4.24	5.42	6.18	6.38	5.68	5.92	3.94	5.02	4.16	4.48	5.14	4.50
12.....	4.26	5.35	6.02	6.30	5.58	6.20	3.90	4.75	4.10	4.40	5.10	4.58
13.....	4.26	5.28	5.92	6.80	5.52	6.08	3.89	4.45	4.11	4.50	4.88	4.52
14.....	4.26	5.30	5.80	6.72	5.52	5.72	3.86	4.28	4.28	4.52	4.78	4.58
15.....	4.26	5.25	5.65	5.95	5.52	5.48	3.84	4.22	4.22	4.48	4.76	4.58
16.....	4.26	5.26	5.48	6.05	5.62	5.35	3.88	4.92	4.16	4.44	4.72	4.62
17.....	4.26	5.21	5.49	6.05	5.52	5.48	4.00	4.82	4.10	4.40	4.72	4.68
18.....	4.36	5.18	5.44	7.50	5.60	5.58	3.99	4.75	4.05	4.35	4.62	4.68
19.....	5.10	5.15	5.44	8.85	5.75	5.42	3.95	4.62	4.06	4.32	4.55	4.68
20.....	5.22	5.05	5.42	8.00	5.70	5.18	3.91	4.45	4.04	4.32	4.58	4.66
21.....	5.22	5.08	5.68	6.12	5.95	4.98	3.88	4.32	4.00	4.32	4.55	4.62
22.....	7.28	5.35	6.18	6.10	5.80	4.82	3.92	4.28	3.99	4.38	4.52	4.62
23.....	6.70	5.49	7.22	6.25	5.82	4.78	4.00	4.22	3 96	4.68	4.52	4.62
24.....	6.20	5.55	8.10	5.15	6.12	4.69	3.97	4.16	3.94	4.55	4.56	4.78
25.....	6.05	5.50	8.65	5.70	6.58	4.60	3.95	4.18	4.30	4.58	4.50	4.95
26	5.70	5.39	8.70	5.85	7.30	4.50	3.96	4.14	5.05	4.72	4.48	5.12
27.....	5.35	5.55	7.59	5.72	6.58	4.50	3.96	4.10	7.68	4.84	4.48	5.12
28.....	5.19	9.48	7.52	5.85	6.12	4.45	4.00	4.05	6.60	5.28	4.42	5.14
29.....	5.12	......	8.42	5.90	6.02	4.46	4.11	4.02	6.22	5.22	4.42	5.14
30.....	5.08	......	9.05	5.90	6.08	4.38	4.02	4.00	5.92	5.20	4.40	5.75
31.....	5.18	......	9.05	......	6.12	......	3.95	4.00	......	4.92	......	6.78

NOTE.— Ice conditions prevailed January 1 to 21; February 1 to 28; December 3 to 31. Log jam from April 10 to 25.

Daily discharge in second-feet, of Sacandaga River at Wells, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	51	470	4,070	4,690	990	2,130	152	54	60	540	292	160
2.....	51	450	3,750	4,170	945	1,900	155	50	70	440	276	160
3.....	54	440	2,940	3,110	1,080	1,680	138	54	104	360	292	50
6.....	55	440	2,290	2,780	1,130	1,600	120	280	253	316	390	50
5.....	58	450	1,980	2,910	1,080	1,680	113	480	232	268	670	104
6.....	64	460	1,810	2,780	1,080	2,030	92	260	260	268	656	200
7.....	66	470	1,860	2,630	1,080	2,390	50	152	219	242	635	232
8.....	67	480	1,540	2,210	990	1,680	70	120	180	225	588	164
9.....	67	490	1,420	1,540	990	1.180	62	106	152	232	528	116
10.....	67	490	1,360	935	836	990	50	104	125	219	492	104
11.....	66	508	1,260	894	804	1,010	58	390	106	189	450	80
12.....	69	470	1,100	850	726	1,280	50	280	92	165	430	104
13.....	69	449	1,010	1,140	684	1,160	48	180	94	195	332	86
14.....	69	464	900	1,100	684	836	44	135	135	201	292	104
15.....	69	444	780	670	684	656	41	120	120	189	284	104
16.....	69	454	656	720	756	570	47	348	106	177	268	116
17.....	69	433	663	720	684	656	70	308	92	165	268	134
18.....	93	441	628	1,620	740	726	68	280	81	152	232	134
19.....	322	414	628	2,710	860	614	60	232	83	145	210	134
20.....	443	373	614	2,000	820	470	52	180	79	145	219	128
21.....	492	391	804	755	1,040	372	47	145	70	145	210	116
22.....	2,790	536	1,260	745	900	308	54	135	68	160	201	116
23.....	1,920	630	2,410	822	918	292	70	120	62	253	201	116
24.....	1,300	677	3,540	298	1,200	256	64	106	58	210	213	164
25.....	1,140	650	4,310	545	1,680	225	60	110	140	219	195	220
26.....	820	582	4,380	945	2,510	195	62	101	405	268	189	295
27.....	570	698	2,870	836	1,680	195	62	92	2,980	316	189	295
28.....	475	4,850	2,780	945	1,200	180	70	81	1,700	528	171	305
29.....	440	......	3,990	990	1,100	183	94	74	1,300	492	171	505
30.....	420	......	4,870	990	1,160	160	74	70	1,010	480	165	(305)
31.....	470	......	4,870	......	1,200	......	60	70	......	348	......	(305)

NOTE.— Daily discharge during the periods of ice conditions based on measurements made under ice cover, climatological reports and on intercomparison of discharge of Sacandaga stations.

Daily discharge during open period based on a fairly well defined rating below 8 feet.

Log jam conditions from April 10 to 25. Special rating table used.

Monthly discharge of Sacandaga River at Wells, N. Y., for 1910.
[Drainage area, 263 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile		
January	2,790	51	412	1.56	1.80	C
February	4,850	373	646	2.45	2.55	C
March	4,870	614	2,170	8.25	9.51	B
April	4,690	298	1,600	6.08	6.78	B
May	2,510	684	1,014	3.95	4.55	A
June	2,390	160	920	3.50	3.90	A
July	155	41	72.8	.277	.32	A
August	480	50	168	.639	.74	A
September	2,980	58	348	1.32	1.47	A
October	540	145	266	1.01	1.16	A
November	670	165	324	1.23	1.37	B
December	305	50	161	.612	.71	C
The year	4,870	41	677	2.57	34.86	

Sacandaga River at Northville, N. Y.

This station is located about ¾ mile upstream from the steel highway bridge at Northville, and was established August 26. 1907 and discontinued November 30, 1910. It has been maintained in co-operation with the U. S. Geological Survey to obtain general statistical and comparative data regarding the flow of the Sacandaga river.

This station is located about 1 mile below the outlet of East Stony creek and about 2 miles below that of West Stony creek. It is about 1¼ miles above a low storage dam at Sacandaga park in Northville. Pondage from this dam extends to the highway bridge at certain stages.

A chain gage, attached to a cantilever arm fastened to a tree on the left bank, is read daily. Measurements are made during high water from the steel highway bridge in the village of Northville, medium and low water measurements are made by wading a short distance above the gage.

The datum of the gage has remained the same during the maintenance of the station. The U. S. Weather Bureau maintain a river and flood station at the steel highway bridge. During the winter months the discharge is usually affected by the presence of ice to such an extent that gage readings are discontinued. Conditions for obtaining the accurate discharge for the remainder of the year are very good and an excellent rating curve has been developed.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Discharge Measurements of Sacandaga River at Northville, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Jan. 11	C. C. Covert	117	188	1.36	*2.35	(*a*)255
Mar. 26	W. G. Hoyt	289	2,350	5.70	*7.88	13,400
Mar. 28	W. G. Hoyt	287	1,730	4.14	*6.14	7,170
Mar. 29	W. G. Hoyt	280	1,900	5.04	*7.14	9,570
April 12	E. H. Sargent	280	1,910	4.74	*6.94	9,050
April 14	W. G. Hoyt	277	968	1.52	*2.84	1,470
June 7	W. G. Hoyt	284	1,790	3.69	*5.90	6,610
June 8	W. G. Hoyt	282	1,600	3.21	*5.26	5,140
July 18	J. J. Phelan	266	784	.32	*1.20	247
Aug. 26	J. J. Phelan	85.6	143	2.08	*1.42	(*b*)298
Oct. 28	W. G. Hoyt	270	914	1.43	*2.74	1,310

* Corrected gage heights, 0.74 feet, has been added to conform with original gage datum.

(*a*) Measurement made about 1,000 feet above gage, under complete ice cover; ice at gage 1.95 feet thick.

(*b*) Measurement made at wading section.

Daily gage height, in feet, of Sacandaga River at Northville, N. Y., for* 1910.

[E. E. Parkes, Jr., observer.]

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	7.61	4.84	3.62	1.62	1.70	1.54	3.74	2.54	......
2	......	7.34	4.06	3.84	1.54	1.72	1.49	3.64	2.59	......
3	......	6.13	4.18	3.64	1.54	1.74	1.72	3.02	2.52	......
4	......	5.52	5.15	3.74	1.54	1.72	1.74	2.74	1.74	......
5	......	6.02	5.02	3.84	1.44	1.64	1.72	3.09	1.62	......
6	......	5.66	4.32	5.94	1.22	1.42	1.79	2.74	1.72	......
7	......	6.14	3.82	5.25	1.23	1.44	1.74	2.49	1.74	......
8	......	4.94	3.74	4.99	1.49	1.49	1.72	1.84	1.96	......
9	......	4.44	3.42	4.74	1.26	1.64	1.64	2.74	1.94	......
10	......	4.14	3.15	4.12	1.24	1.74	1.54	2.84	1.84	......
11	......	3.89	3.04	4.04	1.22	2.34	1.44	2.74	1.74	......
12	......	3.04	2.89	4.24	1.19	1.92	1.39	2.89	1.72	......
13	......	2.93	2.74	3.74	1.21	1.74	1.34	2.74	1.74	......
14	......	2.83	2.82	3.24	1.16	1.84	1.42	2.76	2.16	......
15	......	2.79	2.82	3.16	1.11	1.71	1.44	2.82	2.12	......
16	......	2.74	2.75	3.29	1.14	1.69	1.39	2.72	2.12	......
17	......	2.83	2.52	3.42	1.19	1.64	1.54	2.69	2.22	......
18	......	4.89	2.64	3.49	1.17	1.59	1.45	2.66	2.24	......
19	......	6.04	2.76	3.54	1.14	1.69	1.32	2.62	2.29	......
20	3.74	5.84	3.02	3.02	1.13	1.64	1.14	2.64	2.14	......
21	3 54	4.87	3.54	2.74	1.14	1.62	1.22	2.74	2.12	......
22	3.84	3.89	3.49	2.54	1.16	1.54	1.24	2.94	2.09	......
23	4.34	3.69	3.44	2.26	1.19	1.34	1.54	3.74	2.14	......
24	4.84	4.94	3.14	2.09	1.21	1.34	1.55	3.71	2.12	......
25	7.14	5.64	3.24	2.04	1.23	1.34	1.46	3.62	2.07	......
26	7.84	4.12	5.69	1.99	1.19	1.40	3.54	3.64	2.09	......
27	6.29	4.99	5.54	1.94	1.21	1.36	4.04	3.69	2.04	......
28	6.19	5.61	4.62	1.89	1.72	1.39	4.02	3.65	2.03	......
29	7.64	4.91	3.64	1.76	1.44	1.34	3.81	3.62	1.99	......
30	7.94	......	4.04	1.74	1.26	1.19	3.64	3.24	2.04	......
31	8.48	......	3.74	......	1.22	1.39	......	2.72	......	......

* .74 has been added to make reading conform to original gage datum. Records would seem to indicate that gage heights during June and October are in error.

Daily discharge, in second-feet, of Sacandaga River at Northville, N. Y., for 1910.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	11,200	4,390	2,450	360	400	326	2,620	1,090	....
2	....	10,400	3,090	2,760	326	412	307	2,480	1,140	....
3	....	7,050	3,280	2,480	326	424	412	1,650	1,070	....
4	....	5,710	4,960	2,620	326	412	424	1,300	424	....
5	....	6,800	4,720	2,760	291	370	412	1,740	360	....
6	....	6,010	3,500	6,620	223	284	454	1,300	412	....
7	....	7,080	2,730	5,160	226	291	424	1,040	424	....
8	....	4,570	2,620	4,660	307	307	412	488	578	....
9	....	3,700	2,170	4,210	235	370	370	1,300	562	....
10	....	3,210	1,820	3,180	229	424	326	1,420	488	....
11	....	2,840	1,670	3,060	223	901	291	1,300	424	....
12	....	1,670	1,480	3,370	214	546	275	1,480	412	....
13	....	1,530	1,300	2,620	220	424	259	1,300	424	....
14	....	1,410	1,390	1,930	205	488	284	1,330	742	....
15	....	1,360	1,390	1,830	191	406	291	1,390	709	....
16	....	1,300	1,320	2,000	200	395	275	1,280	709	....
17	....	1,410	1,070	2,170	214	370	326	1,250	794	....
18	....	4,480	1,190	2,270	208	346	294	1,220	811	....
19	....	6,840	1,330	2,340	200	395	253	1,170	855	....
20	2,620	6,400	1,650	1,650	197	370	200	1,190	726	....
21	2,340	4,450	2,340	1,300	200	360	223	1,300	709	....
22	2,760	2,840	2,270	1,090	205	326	229	1,540	684	....
23	3,530	2,550	2,200	829	214	259	326	2,620	726	....
24	4,390	4,570	1,800	684	220	259	330	2,570	709	....
25	9,750	5,960	1,930	643	226	259	297	2,450	667	....
26	11,900	3,180	6,070	602	214	278	2,340	2,480	684	....
27	7,440	4,660	5,750	562	220	266	3,060	2,550	643	....
28	7,200	5,900	4,000	523	412	275	3,030	2,490	635	....
29	11,300	4,520	2,480	436	291	259	2,720	2,450	602	....
30	12,300	(4,460)	3,060	424	235	214	2,480	1,930	643	....
31	14,100	....	2,620	....	223	275	....	1,280	....	....

Record for June low. Record for October high, due to errors in gage heights.

Monthly discharge of Sacandaga River at Northville, N. Y., for 1910.
[Drainage area, 740 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches in drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
March 20-31	14,100	2,340	7,470	10.09	4.50	B
April	11,200	1,300	4,600	6.22	6.94	A
May	6,070	1,070	2,630	3.55	4.09	A
June	6,620	424	2,240	3.03	3.38	C
July	412	191	245	.331	.38	A
August	901	214	367	.496	.57	A
September	3,060	200	722	.976	1.09	A
October	2,620	488	1,670	2.26	2.61	C
November	1,140	360	662	.895	1.00	A

Sacandaga River at Upper Bridge near Hadley, N. Y.

This station is located at the steel highway bridge about 2½ miles west of Hadley. It was established September 13, 1907, in co-operation with the U. S. Geological Survey to obtain general and statistical data regarding the flow of the Sacandaga river, which has important storage and power possibilities.

The nearest dam is at Conklingville, about 3½ miles upstream and is partially washed away and not used at present. Occasional log jams occur in the vicinity of this station, causing back water. The discharge is somewhat affected by ice during the winter months.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. Conditions for making accurate discharge measurements are fair, except during the existence of log jams. The rating curve is fairly well developed. Discharge measurements are made from the bridge.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Discharge measurements of Sacandaga River at Upper Bridge, near Hadley, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Jan. 21	W. G. Hoyt	207	1,340	.54	3.92	(*a*)716
Mar. 5	C. C. Covert	282	1,250	8.98	5.65	11,200
Mar. 6	C. C. Covert	274	1,190	8.20	5.50	9,740
Mar. 31	W. G. Hoyt	286	1,420	10.20	6.15	14,500
April 5	W. G. Hoyt	285	1,020	7.68	4.68	7,840
Oct. 2	J. J. Phelan	254	383	3.45	2.62	1,320

(*a*) Measurement made through ice about one mile below second bridge. Average thickness 1.40 feet.

Daily gage height, in feet, of Sacandaga River at Upper Bridge, near Hadley, N. Y., for 1910.

[W. W. Jeffers, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.48	5.15	14.3	6.45	4.05	3.72	1.92	1.5	1.3	2.85	2.28	1.95
2	3.55	5.25	14.3	6.5	3.98	3.58	1.82	1.55	1.42	2.65	2.22	1.9
3	3.55	5.45	14.5	6.25	3.8	3.50	1.8	1.58	1.48	2.45	2.12	1.88
4	3.55	5.55	13.1	5.6	3.82	3.38	1.75	1.6	1.5	2.25	2.35	1.85
5	3.6	5.35	5.75	4.9	3.90	3.35	1.7	1.95	1.62	2.15	2.7	1.8
6	3.6	5.15	5.45	4.55	3.98	3.95	1.62	2.15	1.75	1.98	2.95	1.75
7	3.55	7.3	5.1	4.45	3.85	4.65	1.6	2.3	1.95	1.92	3.08	1.8
8	3.5	7.4	4.85	4.3	3.82	4.58	1.55	2.05	2.0	1.90	3.0	1.85
9	3.5	7.6	4.7	4.2	3.72	4.60	1.5	1.88	1.88	1.85	2.88	1.82
10	3.45	7.75	4.65	4.15	3.55	4.4	1.5	1.8	1.78	1.82	2.8	1.8
11	3.4	7.85	4.55	3.75	3.32	4.42	1.5	1.75	1.75	1.8	2.68	1.9
12	3.3	8.0	4.4	3.55	3.28	4.35	1.45	2.05	1.7	1.78	2.6	2.05
13	3.18	8.0	4.25	3.48	3.05	4.4	1.45	1.95	1.62	1.75	2.55	2.5
14	3.85	.....	4.2	3.4	3.02	4.3	1.4	1.75	1.68	1.78	2.5	2.6
15	2.55	.....	4.1	3.25	2.92	4.1	1.4	1.7	1.82	1.75	2.48	2.75
16	2.5	.....	4.0	3.05	2.90	3.75	1.4	1.68	1.78	1.7	2.42	2.95
17	2.5	.....	3.9	2.95	2.8	3.52	1.42	1.62	1.72	1.65	2.38	3.12
18	2.55	.....	3.75	3.6	2.85	3.22	1.5	1.65	1.68	1.65	2.28	3.22
19	2.9	.....	3.55	4.2	2.7	3.55	1.48	1.7	1.62	1.6	2.2	3.28
20	3.38	7.2	3.25	4.42	2.78	3.52	1.4	1.75	1.58	1.6	2.15	3.32
21	3.8	7.2	3.05	4.5	2.95	3.38	1.4	1.7	1.52	1.55	2.1	3.4
22	4.45	7.28	3.4	4.35	3.05	3.15	1.42	1.6	1.5	1.58	2.08	3.45
23	8.0	7.32	3.75	4.15	3.32	2.92	1.42	1.58	1.45	1.7	2.02	3.5
24	8.35	7.38	4.15	3.95	3.35	2.75	1.4	1.52	1.4	1.78	1.98	3.55
25	7.85	7.35	4.5	3.88	3.52	2.48	1.4	1.5	1.5	1.88	1.9	3.58
26	7.45	7.25	4.85	3.92	4.15	2.25	1.4	1.45	1.58	1.92	1.98	3.6
27	6.8	7.15	5.35	4.1	4.50	2.18	1.45	1.4	1.75	1.98	2.0	3.65
28	6.2	7.6	5.55	4.35	4.28	2.12	1.5	1.4	2.85	2.05	2.05	3.7
29	5.9	.....	5.75	4.35	4.32	2.05	1.55	1.4	3.2	2.4	2.02	3.75
30	5.5	.....	5.95	4.12	4.05	2.0	1.6	1.35	3.1	2.5	2.0	3.78
31	5.15	.....	6.15	.....	3.85	.....	1.52	1.32	.....	2.38	.....	3.8

Ice and log obstruction, January 1 to March 4, inclusive; also December 12 to 31, inclusive

Daily discharge, in second-feet, of Sacandaga River at Upper Bridge near Hadley, N. Y., for 1910

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	300	1,200	22,000	15,000	4,930	3,930	606	340	250	1,830	966
2	300	1,200	20,000	15,200	4,710	3,340	534	370	300	1,490	894
3	300	1,200	15,000	14,000	4,160	3,320	520	388	330	1,190	782
4	300	1,200	12,000	11,100	4,220	3,010	490	400	340	930	1,060
5	300	1,200	11,700	8,050	4,460	2,940	460	630	412	815	1,570
6	300	1,200	10,400	6,660	4,710	4,620	412	815	490	654	2,020
7	300	1,000	8,890	6,290	4,310	7,040	400	990	630	606	2,300
8	300	1,000	7,840	5,760	4,220	6,770	370	715	670	590	2,120
9	300	1,000	7,240	5,420	3,930	6,850	340	576	576	555	1,880
10	300	1,000	7,040	5,260	3,460	6,110	340	520	508	534	1,740
11	300	1,000	6,660	4,020	2,860	6,180	340	490	490	520	1,540
12	300	1,000	6,110	3,460	2,760	5,940	315	715	460	508	1,410
13	300	975	5,590	3,270	2,230	6,110	315	630	412	490	1,340
14	300	975	5,420	3,060	2,160	5,760	290	490	448	508	1,260
15	300	975	5,090	2,690	1,960	5,090	290	460	534	490	1,230
16	300	975	4,770	2.230	1,920	4,020	290	448	508	460	1,150
17	300	975	4,460	2,020	1,740	3,370	300	412	472	430	1,090
18	400	975	4,060	3,590	1,830	3,620	340	430	448	430	966
19	600	975	3,500	5,420	1,570	3,460	330	460	412	400	870
20	700	975	2,690	6,180	1,710	3,370	290	490	388	400	815
21	716	1,000	2,230	6,470	2,020	3,010	290	460	352	370	760
22	7,000	1,100	3,060	5,940	2,230	2,460	300	400	340	388	742
23	10,000	1,200	4,060	5,260	2,860	1,960	300	388	315	460	688
24	6,000	1,300	5,260	4,620	2,940	1,660	290	352	290	508	654
25	4,000	1,400	6,470	4,400	3,370	1,230	290	340	340	576	590
26	3,000	1,500	7,840	4,520	5,260	930	290	315	388	606	654
27	2,000	1,750	9,960	5,090	6,470	848	315	290	490	654	670
28	1,500	15,000	10,800	5,940	5,690	782	340	290	1,830	715	715
29	1,500	......	11,700	5,940	5,830	715	370	290	2,570	1,120	688
30	1,200	......	12,700	5,160	4,930	670	400	270	2,340	1,260	670
31	1,200	......	13,600	......	4,310	......	352	258	......	1,090	......

Back water and ice conditions January 1, to March 4, inclusive. December records not yet available.

Monthly discharge of Sacandaga River at Upper Bridge near Hadley, N. Y., for 1910.

[Drainage area, 1050 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy
	Maximum.	Minimum.	Means.	Per square mile.		
January	10,000	300	1,450	(1.38)	(1.59)	D
February	15,000	975	1,620	(1.54)	(1.60)	D
March	22,000	2,230	8,330	(7.93)	(9.14)	D
April	15,200	2,020	6,070	5.78	6.45	C
May	6,470	1,570	3,540	3.37	3.88	C
June	7,040	670	3,640	3.47	3,87	C
July	606	290	358	.341	.39	C
August	990	258	465	.443	.51	C
September	2,570	250	611	.582	.65	C
October	1,830	370	696	.663	.76	C
November	2,300	590	1,130	1.08	1.20	C

Sacandaga River Cable Station, near Hadley, N. Y.

This station is located on the Sacandaga river about 1 mile above the mouth of the stream and 6 miles by river, below the proposed dam at Conklingville. It was established November 12, 1910, to obtain data applicable to the proposed storage on this stream.

The river channel at this point was cleared of boulders to make the cross section comparatively smooth and permanent, and a ⅝-inch galvanized wire rope, from which discharge measurements are made, was stretched across the stream.

About 30 feet down stream from the cable and on the left bank, a concrete well was built, 3 feet square, inside dimensions. The bottom of the well is about 2 feet below low water and 12 feet below ground surface; it is connected with the river by a 4-inch cast iron water pipe, 48 feet in length, having its intake end pointing down stream and protected by a fine wire screen. Inside of the well and securely bolted to the side is a bed plank to which is fastened a staff gage with its zero at elevation (573.36) referred to a U. S. Geological Survey aluminum tablet set in the foundation wall of the Union Bag and Paper Company's mill at Hadley. On top of the well is a concrete shelter 6 feet high and 3 feet square, inside dimensions, for protecting the recording gage.

Discharge measurements of Sacandaga River at Cable Station near Hadley, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Oct. 28......	J. J. Phelan................	215	453	2.11	3.80	948
Oct. 30......	J. J. Phelan................	215	499	2.36	4.10	1,190
Oct. 31......	J. J. Phelan................	215	457	2.26	3.90	1,030
Nov. 2......	J. J. Phelan................	213	446	1.82	3.70	806
Nov. 12......	F. J. Shuttleworth...........	218	592	2.43	4.12	1,440
Dec. 1......	J. J. Phelan................	210	399	1.58	3.43	632

Sacandaga River, Union Bag & Paper Company's Mill, Hadley, N. Y.

This station is located at the steel highway bridge near the Union Bag & Paper Company's mills at Hadley, N. Y. It was established in co-operation with the U. S. Geological Survey, September 24, 1909. to obtain general statistical and comparative data in regard to the flow of the Sacandaga and to eliminate discrepancies due to log jams occurring at the Hadley station.

A chain gage is attached to the bridge from which the discharge measurements are made.

No tributaries of any importance enter the river between this station and the one on the second highway bridge near Hadley, N. Y. Gage heights are observed twice daily and furnished through the courtesy of the Union Bag & Paper Company. There are times in the year when the gage heights are affected by back water from the Hudson. Conditions for making discharge measurements are good, and such measurements have been used in connection with those taken at the Hadley station to develop a fairly good rating curve.

Discharge measurements of Sacandaga River at U. B. and P. Co. Mill near Hadley, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Feb. 17	Covert and James	98	563	1.36	5.66	(*a*)765
Mar. 1	Covert and Sargent	130	1,100	6.54	9.85	(*b*)7,[illegible]90
Mar. 1	Covert and Sargent	130	1,230	6.90	9.90	8,490
April 5	W. G. Hoyt	131	1,230	8.30	10.7	10,200
June 18	Covert and Phelan	126	841	3.61	7.88	3,040
June 20	C. C. Covert	97	443	0.74	4.50	328
July 22	J. J. Phelan	103	478	0.68	4.48	325
Aug. 6	Phelan and Carman	108	564	1.51	5.87	850
Aug. 10	Phelan and Carman	91	528	0.66	4.65	350
Sept. 21	J. J. Phelan	90	422	0.60	4.50	(*c*)252
Sept. 23	J. J. Phelan	90	428	0.74	4.46	315
Oct. 1	J. J. Phelan	121	718	2.67	6.90	1,920
Oct. 1	J. J. Phelan	121	687	2.65	6.73	1,820
Oct. 2	J. J. Phelan	118	633	2.20	6.30	1,390
Oct. 2	J. J. Phelan	120	650	2.23	6.40	1,450
Oct. 3	J. J. Phelan	116	604	1.70	6.01	1,030
Oct. 4	J. J. Phelan	116	594	1.60	5.80	948
Oct. 5	J. J. Phelan	114	576	1.39	5.60	803
Oct. 6	J. J. Phelan	113	556	1.29	5.49	720
Oct. 7	J. J. Phelan	111	540	1.19	5.34	644
Oct. 8	J. J. Phelan	101	527	1.19	5.23	626
Oct. 9	J. J. Phelan	104	520	1.24	5.20	643
Oct. 10	J. J. Phelan	101	491	1.23	5.12	602
Oct. 12	J. J. Phelan	101	491	1.15	5.11	564
Oct. 12	J. J. Phelan	101	480	1.24	5.02	593
Oct. 14	J. J. Phelan	101	487	1.11	5.00	536
Oct. 17	J. J. Phelan	92	470	1.11	4.92	521
Oct. 18	J. J. Phelan	92	460	1.07	4.90	494
Oct. 19	J. J. Phelan	92	455	0.99	4.84	452
Oct. 27	J. J. Phelan	104	518	1.46	5.45	756

(*a*) Section practically open at gage, but ice obstruction below.
(*b*) Some back water affect from the Hudson River.
(*c*) Current very erratic and swirly.

West Branch of Sacandaga River at Whitehouse, N. Y.

The West Branch is formed by Piseco Lake outlet uniting with a small stream formed in Silver Lake mountain.

The drainage area is principally bold forest country and is about 188 square miles in extent above Whitehouse where the gaging station is established. The West Branch discharges into the main river about 7 miles west of Whitehouse and about 1 mile south of Wells.

This station was established August 20, 1910, in co-operation with the U. S. Geological Survey, to obtain general statistical and comparative data regarding the flow of the West Branch.

Not enough measurements have been made to determine a rating for this station.

Discharge measurements of West Branch, Sacandaga River, at Whitehouse, N. Y., in 1910.

DATE.	Hydrographer	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 16	J. J Phelan	126	132	0.58	3.32	(*a*)76.4
Aug. 20	J. J. Phelan	124	156	.80	3.50	(*a*)125

(*a*) **Measurements made at wading section.**

Daily gage heights of West Branch of Sacandaga River at Whitehouse, N. Y., for 1910.

[John Seaver, observer.]

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	3.30	3.95	......	3.4	17	......	3.30	3.4	3.85	3.95
2	......	3.30	3.8	......	3.4	18	......	3.30	3.4	3.8	4.0
3	......	3.30	3.7	......	3.35	19	......	3.30	3.4	3.75	4.0
4	......	3.38	3.68	......	3.4	20	3.50	3.30	3.4	3.8	4.0
5	......	3.30	3.7	4.1	3.4	21	3.50	3.30	3.4	3.8	4.0
6	......	3.70	3.7	4.2	3.4	22	3.42	3.30	3.4	3.8	4.0
7	......	3.65	3.7	4.1	3.3	23	3.40	3.30	3.45	3.7	4.0
8	......	3.65	3.7	4.02	3.3	24	3.40	3.40	......	3.5	4.3
9	......	3.70	3.6	3.98	3.4	25	3.40	3.55	......	3.5	4.3
10	......	3.65	3.55	4.0	3.5	26	3.42	4.00	......	3.4	4.3
11	......	3.45	3.5	4.0	3.8	27	3.38	4.05	......	3.4	4.3
12	......	3.40	3.4	4.0	3.8	28	3.38	4.30	......	3.7	4.32
13	......	3.40	3.4	4.0	3.8	29	3.34	4.15	......	......	4.4
14	......	3.40	3.4	3.98	3.85	30	3.33	4.00	......	3.4	5.0
15	......	3.40	3.4	3.9	3.85	31	3.33	......	......	......	5.0
16	......	3.30	3.4	3.9	3.9						

CATTARAUGUS CREEK DRAINAGE BASIN.

Description.

Cattaraugus creek rises in the southwestern part of Wyoming county and flows in a westerly direction, entering Lake Erie about 25 miles southwest of Buffalo, on the boundary line between Erie and Chautauqua counties. The stream is about 55 miles in length and drains an area of approximately 560* square miles above the mouth. A large portion of its course forms the boundary between Erie and Chautauqua counties. Its head waters rise at an elevation of between 1,900 to 2,000 feet. The drainage basin is hilly, fairly well timbered and rather narrow. There are few tributary streams, those of most importance entering the river from the south.

South branch of Cattaraugus creek, which is the largest tributary, enters at a point about 2 miles above Gowanda. There is a dam at Gowanda which is used for developing electric power and also for running a local grist mill and foundry. Formerly there was a development at Versailles, but a flood a few years ago washed the dam out and at present the developments at Gowanda are practically the only ones on the stream.

The average rain fall on the drainage basin is approximately 40 inches. A gaging station was established on this stream at Versailles, September 23, 1910.

Cattaraugus Creek, at Versailles, N. Y.

This station is located at the highway bridge in the village of Versailles, about 8 miles above the mouth of the stream, 6 miles below Gowanda and 3 miles from Lawton Station on the Erie railroad. It was established September 23, 1910, in co-operation with the U. S. Geological Survey, to obtain information regarding the flow of Cattaraugus creek, the principal tributary to Lake Erie from New York.

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* From Fifth Annual Report of the State Water Supply Commission.

A standard chain gage, reading from 2 feet to 21.5 feet is located on the upstream side of the bridge over the right hand channel. The bridge consists of 3 spans of 117 feet each. Measurements are made from the down stream side of the bridge. Discharge measurements and gage heights only are published.

Discharge measurements of Cattaraugus Creek, at Versailles, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean. velocity.	Gage height.	Dis-charge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Aug. 24	C. C. Covert	118	167	0.886	5.02	148
Sept. 23	C. C. Covert	130	185	.741	5.00	137

Daily gage heights, in feet, of Cattaraugus Creek at Versailles, N. Y., for 1910.

[James A. Palmer, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Sept.	Oct.	Nov.	Dec.
1	......	5.05	6.45	6.45	16	......	5.08	6.18	5.45
2	......	4.95	6.55	6.42	17	......	5.02	6.10	5.60
3	......	4.90	6.15	6.15	18	......	5.05	6.02	5.60
4	......	5.05	5.78	5.95	19	......	5.02	5.98	5.82
5	......	5.01	5.60	5.90	20	......	5.02	5.90	5.80
6	......	5.20	5.60	5.68	21	......	5.00	5.82	5.72
7	......	6.15	5.70	5.70	22	......	5.62	5.80	5.62
8	......	5.55	5.72	5.65	23	5.05	5.75	5.85	5.70
9	......	5.28	5.78	5.60	24	5.01	5.40	6.68	5.72
10	......	5.22	7.68	5.72	25	5.09	5.48	6.95	5.70
11	......	5.18	7.32	5.70	26	5.05	5.85	6.55	5.75
12	......	5.12	6.48	5.64	27	5.05	5.55	6.22	5.70
13	......	5.08	6.30	5.55	28	5.05	6.38	6.20	5.70
14	......	5.08	6.25	5.65	29	5.05	6.30	6.68	6.98
15	......	5.08	6.22	5.60	30	5.05	6.22	6.40	7.30
					31	......	6.10	......	6.42

GENESEE RIVER DRAINAGE BASIN.

Description.

Genesee river rises in Potter county, Pa., 8 or 10 miles south of the New York-Pennsylvania boundary, flows northwestward for about 32 miles by general course, then turns to the northeast, and empties into Lake Ontario, 7 miles north of Rochester. The entire length of the stream, following bends, is about 135 miles, and the drainage area is about 2,450 square miles.

In the 39 miles between Belmont, in central Allegheny county, and Portage, in southwestern Livingston county, the fall of the water-surface is 253 feet, an average of 6.4 feet per mile. At Portage the river plunges down in three magnificent falls, and thence nearly to Mount Morris flows at the bottom of a deep gorge. From Mount Morris to Rochester the valley is broad and open and the stream is bordered by meadows subject to occasional overflow. At Rochester there is another abrupt descent over three heavy falls, amounting to about 260 feet within the city.

In the northern counties the surface is rolling, with long, easy slopes, except along the streams, which usually lie in deep ravines, hemmed in by steep banks. On the whole there is a gradual rise away from the lakes, and in the upper half of the basin the country becomes rough and is broken by ridges, the summits of which attain elevations of from 2,000 to 2,500 feet above tide.

Precipitation is rather high, the average rainfall being about 35 inches, some 14 inches smaller than that of the upper Sacandaga. Possibilities for storage are great and the State Water Supply Commission of New York proposes a high concrete dam, in the vicinity of Portage, which will store about 18,000,000,000 cubic feet of water, 11,000,000,000 cubic feet of which will be available for commercial purposes. This dam would have a water surface of about 13½ square miles. Such a reservoir would control a flow equal to the greatest recorded, that of 1865. In addition to this high degree of river control the reservoir could be used to develop electric horsepower at Portage to the extent of 75,000 horsepower, peak load, and at the same time allow the mills at Rochester to run the entire year.

Genesee River at St. Helena, N. Y.

This station is located at the steel highway bridge, about 6 miles by river below Genesee lower falls, 4 miles from Castile, and 5½ miles from Portageville. It was established August 14, 1908, in co-operation with the U. S. Geological Survey to obtain general statistical and comparative data regarding the Genesee, which has important storage and power possibilities.

The bed of the stream at this point is of coarse gravel with few rocks and is fairly permanent.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. Two gage readings are made per day. Discharge measurements are made from the highway bridge or by wading.

There has recently been constructed at this station a concrete well and shelter which contain a self-recording gage. The gage house is located on the down-stream side, left-hand end of the bridge. A 4-inch cast-iron water pipe leads to a point in the river channel near the present chain gage, so that the records will be comparable with all previous data.

Information in regard to this station is contained in annual reports of the U. S. Geological Survey.

Discharge measurements of Genesee River at St. Helena, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 21	C. C. Covert	296	889	3.80	4.92	3,380
July 19	W. G. Hoyt	103	203	1.11	2.06	226
Aug. 26	C. C. Covert	102	168	.946	1.92	159
Oct. 24	W. G. Hoyt	133	150	1.43	2.14	*a*214
Nov. 17	W. G. Hoyt	176	392	2.58	3.24	1,010
Dec. 9	W. G. Hoyt	194	298	2.16	2.85	*b*645

a Measurement made at wading section above bridge.
b Measurement made under partial ice cover; slush ice running in considerable amounts.

Daily gage height in feet, of Genesee River, at St. Helena, N. Y., for 1910.

[Herman Piper, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept	Oct.	Nov.	De
1......	2.28	2.85	9.27	3.31	4 90	2.85	2.01	1.78	1.85	2.12	2.58	3.55
2......	2.25	2.72	8.82	3.14	6.80	2.78	1.88	1.90	2.12	2.02	2.50	3.55
3......	2.60	2.95	8.22	2.98	6.65	2.81	1.68	1.88	2.12	1.95	2.45	3.42
4......	2.85	2.72	7.22	3.11	6.75	2.71	1.73	1.82	2.15	2.08	2.60	3.38
5......	2.68	2.78	6.77	3.08	5.35	2.75	1.95	1.82	2.08	1.98	2.30	3.30
6......	2.88	2.65	7.12	2 98	4.72	2.73	1.95	1.78	2.52	2.02	2,20	3.08
7......	2.95	2.60	9.42	2.88	4.25	2.73	1.75	1.55	2.85	2.25	2.32	2.98
8......	2.92	2.78	6.27	2.78	3.95	2.68	1.75	1.55	2.70	2.38	2.30	2.90
9......	2.82	2.75	5.52	2.84	3.78	2.65	1.91	1.80	2.42	2.25	2.32	2.82
10......	2.98	2.68	4.85	2.74	3.68	2.61	1.91	1.95	2.28	2.18	3.00	2.82
11......	2.88	2 62	4.62	2.71	3.50	2.61	1.91	2.15	2.12	2.15	3.95	2.92
12......	2.78	2.45	4.55	2.58	3.35	2.65	1.85	2.02	2.05	2.02	3.48	2.85
13......	2.75	4.25	4.82	2.54	3.22	2.55	2.25	1.70	2.15	1.60	3.50	2.68
14......	2.72	4.05	4.29	2.48	3 08	2.45	2.83	1.70	2.12	1.75	3.22	2.72
15......	2.85	3.92	4.02	2.51	2.98	2.35	2.48	1.90	1.95	2.00	3.32	2.65
16......	2.72	3.89	3.92	2.54	2 88	2.51	2.28	1.95	2.08	1.75	3.25	2.58
17......	2.75	4.47	3.77	2.64	2.88	2.55	2.25	1.62	1.92	1.95	3 28	2.65
18......	3.10	4.07	3.57	3.44	2 78	2.45	2.15	1.72	1.65	1.95	3.15	2.68
19......	4.40	3.77	3 75	4.36	2.85	2 41	2.04	2.05	1.92	1.88	3.10	2.78
20......	4.25	3.59	5.56	4.76	2.68	2.35	2.45	2.02	1.92	1.95	3.00	2.78
21......	4.20	3.62	5.71	4.83	2.75	2.31	1.80	1.70	1.88	2.10	2.92	2.65
22......	6 88	3.57	5.18	4 60	2.62	2.28	1.72	1.90	1.82	1.88	2.82	2.48
23......	5.45	3.82	5.31	3.90	2.65	2.25	1.72	1.80	1.75	1.82	2.92	2.58
24......	4.70	3.52	5.24	6.60	2.88	2.15	1.65	1.88	1.85	2.10	3.00	2.55
25......	4.45	6.42	5.31	8.40	2.92	2.03	2.00	1.58	1.95	2.05	4.08	2.60
26......	3 80	6 85	4 76	9.30	3.08	2.05	2.02	1.92	1.92	2.18	4.08	2.52
27......	3.75	6.69	4.28	6 88	2.95	2.11	1.70	1.65	2.75	2.45	3 65	2.58
28......	3.48	7.72	3.98	5.45	2.82	2.01	1.88	1.52	2.48	2.48	3.38	2.62
29......	3.25	......	3.81	5.85	2.68	1.98	1.90	1.80	2.35	2.72	3.40	2.78
30......	3.12	......	3.46	6.10	2.78	1.95	1.82	1.68	2.25	2.52	4.10	7.80
31......	3.02	......	3 44	......	2.95	......	1.65	1.80	......	2.62	......	5 05

NOTE.— Back water at gage due to ice conditions, January 1–18, and February 25–28. There was probably no ice effect for the remainder of the year.

Daily discharge in second-feet, of Genesee River at St. Helena, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1......	180	672	19,500	1,070	3,390	672	187	121	140	226	470	1,290
2......	180	568	17,000	919	8,340	614	148	154	226	191	420	1,290
3......	190	756	14,000	783	7,880	638	98	148	226	169	391	1,170
4......	200	568	9,730	894	8.180	560	109	132	239	211	482	1.130
5......	200	614	8,250	868	4,360	591	169	132	211	178	308	1,060
6......	200	517	9,380	783	3,030	575	169	121	432	191	260	868
7......	200	482	20,300	698	2,210	575	114	73	672	284	319	783
8......	200	614	6,740	614	1,780	538	114	73	552	351	308	715
9......	200	591	4,750	664	1,560	517	157	126	374	284	319	647
10......	200	538	3,290	583	1.440	489	157	169	298	252	800	647
11......	200	496	2,840	560	1.240	489	157	239	226	239	1,780	732
12......	200	391	2,710	470	1.100	517	140	191	201	191	1,220	672
13......	200	2,210	3,230	445	988	451	284	102	239	80	1,240	538
14......	200	1,910	2.270	408	868	391	656	102	226	114	988	568
15......	200	1,740	1.870	426	783	335	408	154	169	184	1,080	517
16......	200	1,700	1,740	445	698	426	298	169	211	114	1,020	470
17......	200	2,570	1,540	510	698	451	284	84	160	169	1,040	517
18......	400	1,940	1,310	1,190	614	391	239	107	91	169	928	538
19......	2,450	1,540	1,520	2,390	672	368	198	201	160	148	885	614
20......	2,210	1,330	4,840	3,110	538	335	391	191	160	169	800	614
21......	2,130	1 360	5,220	3 250	591	313	126	102	148	218	732	517
22......	8,600	1,310	3,980	2.800	496	298	107	154	132	148	647	408
23......	4,580	1.610	4.260	1.710	517	284	107	126	114	132	732	470
24......	2,990	1,260	4.110	7,720	698	239	91	148	140	218	800	451
25......	2,540	1,500	4,260	14,900	732	194	184	77	169	201	1.950	482
26......	1,580	2,300	3,110	19,700	868	201	191	160	160	252	1.950	432
27......	1,520	5.400	2,260	8.600	758	222	102	91	591	391	1.400	470
28......	1,220	11,700	1,810	4,580	647	187	148	69	408	408	1,130	496
29......	1,020	......	1,590	5,580	538	178	154	126	335	568	1,150	614
30......	902	......	1,200	6,260	614	169	132	98	284	432	1,980	12,100
31......	817	......	1,190	......	758	......	91	126	......	496	......	3.700

NOTE.— From January 1–18 the estimates of discharge are based upon a discharge measurement made in December, 1909, and upon general ice conditions.

February 25–28, daily discharge corrected for ice jam.

Monthly discharge of Genesee River at St. Helena, N. Y., for 1910.

[Drainage area 1030 square miles.]

MONTH.	Discharge in Second-Feet.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	....	....	1,170	1.14	1.31	B
February	11,700	391	1,720	1.67	1.74	A
March	20,300	1,190	5,480	5.32	6.13	A
April	19,700	408	3,100	3.01	3.36	A
May	8,340	496	1,860	1.81	2.09	A
June	672	169	407	.395	.44	A
July	656	91	191	.185	.21	A
August	239	69	131	.127	.15	A
September	672	91	256	.249	.28	A
October	568	80	238	.231	.27	A
November	1,980	260	918	.891	.99	A
December	12,100	408	1,150	1.12	1.29	A
The year	20,300	69	1,380	1.35	18.26	

Genesee River at Jones' Bridge, near Mt. Morris, N. Y.

This station is at the highway bridge known as Jones' bridge, a short distance below the inflow of Canaseraga creek, and is about 5 miles below Mt. Morris. This station was established May 22, 1903, and was discontinued April 30, 1906. It was re-established August 12, 1908, in co-operation with the U. S. Geological Survey to obtain general statistical and comparative data regarding the flow of the Genesee.

The bed of the stream is of clay, and probably subject to change at times. There are two channels at low stages, three at high. The current is good at medium and high stages, but poor during low water conditions.

Discharge measurements are made from a foot bridge erected on the outriggers of the downstream side of the bridge or by wading.

The datum of the chain gage attached to the bridge has remained permanent during the maintenance of the station. Conditions for making discharge measurements are favorable and a fairly good rating table has been developed.

Information in regard to this station is contained in annual reports of the U. S. Geological Survey.

Discharge measurements of Genesee River at Jones' Bridge, near Mt. Morris, in 1910.

DATE.	Hydrographer.	Width	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 20......	C. C. Covert................	153	852	4.34	9.38	3,700
April 21......	C. C. Covert................	145	677	4.09	8.70	2,770
July 20......	W. G. Hoyt................	75	205	1.58	4.08	323
Aug. 22......	C. C. Covert................	48	45.6	2.26	3.35	(*a*)103
Oct. 25......	W. G. Hoyt................	70	193	1.26	3.96	244
Nov. 18......	W. G. Hoyt................	91	333	2.91	5.58	968

(*a*) Measurement made at wading section.

Daily gage height in feet, of Genesee River at Jones' Bridge near Mt. Morris, N. Y., for 1910.
[Elizabeth Trewer, observer.]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.45	8.05	27.85	6.20	12.90	5.50	3.65	3.60	3.70	4.00	4.70	6.85
2.....	4.5	7.7	27.7	5.95	16.10	5.25	3.45	3.65	3.85	4.05	4.60	6.40
3.....	5.0	8.2	27.4	5.75	18.15	5.20	3.45	3.65	3.90	3.90	4.50	6.10
4.....	5.4	8.85	25.95	5.70	21.10	5.05	3.45	3.60	4.00	3.90	4.65	5.95
5.....	5.35	7.55	24.05	5.70	15.80	5.00	3.65	3.55	4.05	3.70	4.45	6.00
6.....	5.3	7.45	23.2	5.65	11.75	5.05	3.55	3.55	4.75	3.90	4.25	5.25
7.....	5.25	7.0	25.75	5.45	9.55	5.10	3.70	3.35	5.10	4.20	4.25	5.35
8.....	5.35	6.9	23.7	5.30	8.40	5.10	3.60	3.40	4.90	4.45	4.30	5.60
9.....	5.3	7.3	18.4	5.15	8.35	5.00	3.60	3.45	4.55	4.20	4.30	6.05
10.....	5.3	7.15	17.85	5.00	7.45	4.90	3.10	3.55	4.25	4.15	4.70	6.05
11.....	5.3	6.85	11.25	5.15	7.05	4.80	3.50	3.85	3.95	4.10	6.60	7.70
12.....	5.3	6.95	10.0	5.15	6.45	4.85	3.50	3.90	3.95	4.05	6.40	7.70
13.....	5.3	6.9	9.4	5.05	6.25	4.80	3.65	3.60	4.00	4.00	5.70	(*a*)7.65
14.....	5.3	6.8	8.75	4.90	6.05	4.60	4.75	3.70	4.00	3.95	5.70	(*a*)7.40
15.....	5.3	6.8	8.35	4.80	5.75	4.50	4.70	3.45	3.75	3.70	5.70	(*a*)7.35
16.....	5.3	6.7	7.8	4.80	5.60	4.60	4.45	3.70	4.00	3.25	5.70	(*a*)7.10
17.....	5.25	7.2	7.5	4.90	5.50	4.55	4.20	3.45	4.00	3.45	5.70	(*a*)6.35
18.....	5.25	9.25	7.1	5.75	5.35	4.40	4.15	3.30	3.40	3.85	5.60	....
19.....	6.95	9.9	7.0	7.80	5.20	4.40	4.10	3.75	3.90	3.60	5.40	....
20.....	9.85	9.7	10.45	8.75	5.10	4.55	4.00	3.95	3.90	3.70	5.40	....
21.....	10.95	9.7	13.45	9.25	5.20	4.50	3.70	3.85	3.75	3.55	5.25	....
22.....	19.25	9.7	11.45	9.80	5.20	4.35	3.80	3.40	3.75	3.55	5.20	....
23.....	19.55	9.7	11.4	8.05	5.15	4.20	3.60	3.60	3.60	3.25	5.10	....
24.....	15.75	9.7	10.7	11.20	5.20	4.10	3.30	3.55	3.50	3.60	5.05	(*a*)6.40
25.....	12.55	9.7	10.95	22.25	5.55	3.90	3.60	3.55	3.20	3.90	6.85	....
26.....	11.15	9.5	10.25	24.65	5.65	3.80	......	3.75	3.80	4.05	7.35	....
27.....	10.45	8.55	8.75	24.45	5.55	3.90	......	3.60	3.90	4.50	6.55	....
28.....	9.75	15.45	7.85	18.50	5.35	3.95	3.80	3.60	4.50	4.40	6.00	....
29.....	8.9	......	7.15	13.40	5.15	3.95	3.60	3.20	4.25	4.60	7.25	....
30.....	8.5	......	6.7	17.65	5.10	3.85	3.65	3.60	4.20	4.80	7.70	(*a*)13.0
31.....	8.25	......	6.35	......	5.15	......	3.10	3.80	......	4.70	......	....

(*a*) Gage height to top of ice.

NOTE.— Back water at gage, due to ice conditions January 1–23, January 30, February 28 and December 9–31; also probably slight affect from ice, for brief periods at other times, January to March and December.

Daily discharge, second-feet of Genesee River at Jones' Bridge near Mount Morris, N. Y., for 1910

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	250	1,400	17,800	1.340	5,880	960	190	175	205	300	575	1.700
2.....	250	1 300	17.700	1,200	8,440	835	138	190	250	318	530	1,450
3.....	250	1,200	17,500	1.090	10,100	810	138	190	265	265	490	1,280
4.....	250	1,000	16.300	1,060	12,400	735	138	175	300	265	552	1,200
5.....	250	1,000	14,800	1.060	8.200	710	190	162	318	205	470	1,230
6.....	250	900	14,100	1,040	4,980	735	162	162	598	265	390	835
7.....	250	800	16,200	935	3,440	760	205	112	760	370	390	800
8.....	250	800	14.500	860	2,660	760	175	125	665	470	410	800
9.....	250	800	10,300	785	2 630	710	175	138	510	370	410	800
10.....	250	800	9,840	710	2,060	665	60	162	390	352	575	800
11.....	250	800	4,620	785	1,820	620	150	250	282	335	1,560	800
12.....	250	800	3,750	785	1,480	642	150	265	282	318	1,450	800
13.....	250	1,600	3,330	735	1.370	620	190	175	300	300	1,060	700
14.....	250	2 000	2,890	665	1,260	530	598	205	300	282	1,060	600
15.....	250	2.400	2,630	620	1,090	490	575	138	220	205	1,060	600
16.....	250	2,500	2,270	620	1,010	530	470	205	300	90	1,060	600
17.....	250	2,600	2,090	665	960	510	370	138	300	138	1,060	600
18.....	250	2,600	1,850	1,090	885	450	352	109	125	250	1,010	600
19.....	1,140	2,300	1,790	2,270	810	450	335	220	265	175	910	650
20.....	2,400	2,100	4,060	2,890	760	510	300	282	265	205	910	650
21.....	4 000	2,100	6,320	3 220	810	490	205	250	220	162	835	650
22.....	9,600	2,100	4.760	3,610	810	430	235	125	220	162	810	600
23.....	5,200	2,100	4,730	2,430	785	370	175	175	175	90	760	500
24.....	4 900	2,100	4,240	4,590	810	335	100	162	150	175	735	500
25.....	4,100	2,100	4,420	13.400	985	265	175	162	80	265	1,700	500
26.....	3.300	2,100	3,920	15.300	1,040	235	195	220	235	318	2,000	500
27.....	2,600	3,200	2,890	15,100	985	265	215	175	265	490	1,530	500
28.....	2,200	3,700	2,300	10,400	885	282	235	175	490	450	1.230	600
29.....	2,100	......	1,880	6,280	785	282	175	80	390	530	1,940	700
30.....	1,900	......	1,620	9,680	760	250	190	175	370	620	2,210	5.000
31.....	1,700	......	1,420	......	785	......	60	235	......	575	......	13,000

NOTE.— Ice conditions which prevailed at this station during January, February and December 6–31, 1910, made it necessary to base discharge for this period upon flow at St. Helena and Rochester and upon climatological reports.

Monthly discharge of Genesee River at Jones' Bridge near Mount Morris, N. Y., for 1910.

[Drainage area, 1,410 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	....	....	1.600	1.13	1.30	D
February	....	....	1,760	1.25	1.30	D
March	17,800	1,420	6,690	4.96	5.72	C
April	15,300	620	3,510	2.49	2.78	C
May	12,400	760	2,630	1.86	2.14	C
June	960	235	541	.384	.43	B
July	598	60	226	.160	.18	B
August	282	80	178	.126	.15	B
September	760	80	316	.224	.25	B
October	620	90	300	.213	.25	B
November	2,210	390	989	.701	.78	B
December	....	....	1,280	.908	1.05	D
The year	17,800	60	1,700	1.20	16.33	

Genesee River at Elmwood Avenue, Rochester, N. Y.

This station is located at a highway bridge about 3½ miles south of the city of Rochester, at the northern end of South Park.

It was established by the U. S. Geological Survey, February 9, 1904, and has been maintained in co-operation with the Barge canal and the State Water Supply Commission to date.

The bed of the river is composed of gravel and is fairly permanent. The bridge consists of six spans of about 125 feet each. Measurements are made with current meter from the up-stream side of the bridge. Conditions are very favorable for making accurate measurements, although in periods of low water small velocities may affect the accuracy somewhat.

A staff gage is fastened to the down-stream face of the first pier from the right-hand abutment of the bridge. This has been read under the direction of E. A. Fisher, City Engineer. During the summer of 1910 a Gurley recording gage was installed in the pump house located at the right-hand end of the bridge and since that time nearly continuous records have been obtained. The datum for both the staff and recording gages has remained the same, zero of gage 506.848, Barge canal datum.

Discharge measurements of Genesee River at Elmwood avenue, Rochester, N. Y., in 1904–1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1904		*Feet.*	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 20	C. C. Covert	......	......	....	1.30	592
Aug. 9	E. A. Fisher	......	......	....	1.18	614
Aug. 10	E. A. Fisher	......	......	....	1.10	589
Aug. 11	E. A. Fisher	......	......	....	1.15	594
Aug. 12	E. A. Fisher	......	......	....	1.20	667
Aug. 15	E. A. Fisher	......	......	....	1.10	587
Aug. 27	E. A. Fisher	......	......	....	1.22	703
Aug. 30	E. A. Fisher	......	......	....	1.08	554
Sept. 17	E. A. Fisher	......	......	....	1.05	511
Nov. 11	C. C. Covert	......	......	....	1.20	534
1905.						
Mar. 22	Covert & Weeks	382	4,220	5.87	10.0	24,710
Mar. 22	Covert & Weeks	382	4,200	5.92	9.95	24,860
Mar. 25	Covert & Weeks	382	4,300	5.92	10.20	25,490
Mar. 27	Covert & Weeks	382	4,200	6.00	9.92	25,180
Mar. 27	Covert & Weeks	382	4,160	5.94	9.82	24,750
Mar. 28	Covert & Weeks	382	4,050	5.82	9.50	23,550
Mar. 29	Covert & Weeks	382	3,960	5.69	9.08	22,530
April 2	Covert & Weeks	373	2,140	3,06	4.18	6,530
April 3	Covert & Weeks	372	1,890	2.75	3.50	5,197
April 4	Covert & Weeks	372	1,820	2.52	3.28	4,576
May 28	C. C. Covert	352	974	.45	1.11	441
1906.						
Feb. 14	Covert & Weeks	306	1,710	0.43	1.40	(*a*)728
Feb. 15	Covert & Weeks	360	1,020	.88	1.53	(*a*)894
Mar. 28	Weeks & Casey	383	3,160	4.47	6.85	14,110
Mar. 29	Weeks & Casey	383	3,320	4.55	7.32	15,090
Mar. 30	Weeks & Casey	383	2,680	3.58	5.64	9,580
Mar. 31	Weeks & Casey	383	2,860	4.33	6.06	12,370
Mar. 31	Weeks & Casey	383	2,940	4.54	6.31	13,340
April 1	Weeks & Casey	384	3,040	4.67	6.60	14,190
April 1	Weeks & Casey	383	3,050	4.25	6.36	12,960
April 2	Weeks & Casey	376	2,480	3.56	5.08	8,830
April 2	Weeks & Casey	375	2,330	3.08	4.70	7,160
April 3	Weeks & Casey	374	2,100	2.79	4.10	5,860
1907.						
Mar. 18	C. C. Covert	383	2,820	3.95	6.02	11,130
May 2	E. C. Niles	......	1,821	2.26	3.50	4,117
July 26	E. C. Niles	......	1,074	.738	1.40	793
Aug. 12	E. C. Niles	......	918	.295	.95	271
Aug. 28	E. C. Niles	......	903	.271	.90	245
Aug. 28	E. C. Niles	......	917	.313	.95	287
1908.						
July 14	Niles & Patchke	......	992	.692	1.20	685
Aug. 14	Brett & Adams	341	1,130	....	1.30	670
1909.						
Mar. 15	C. C. Covert	358	1,760	2.28	3.21	4,020
April 21	C. C. Covert	360	1,620	2.35	2.82	3,810
May 11	A. R. Patchke	......	1,960	3.07	3.88	6,013
1910.						
Oct. 22	Hoyt & Shuttleworth	338	1,110	.332	1.07	369
Nov. 18	W. G. Hoyt	248	1,380	.96	1.85	1,320

(*a*) Measurements made under ice conditions.

Daily gage height, in feet, of Genesee River at Elmwood avenue, Rochester, N. Y., in 1910.
[G. A. Bailey, observer.](*a*)

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1......	1.00	2.00	6.60	2.20	6.00	1.80	1.10	1.00	.76	1.3	1.2	......
2......	1.00	2.00	7.20	2.20	5.40	1.80	1.10	1.00	1.00	1.3	1.3	2.32
3......	1.00	2.00	9.00	2.00	6.60	1.80	1.10	1.00	1.00	1.3	1.3	......
4......	1.00	2.00	10.80	1.90	7.50	1.70	1.10	.95	1.00	1.3	1.3	2.09
5......	1.00	2.00	11.00	1.90	7.40	1.70	1.10	.95	1.00	1.3	1.3	2.01
6......	1.00	2.00	10.40	1.90	5.40	1.80	1.08	.90	1.60	1.4	1.3	1.90
7......	1.00	2.00	9.90	1.80	4.00	1.80	1.05	.90	2.20	1.6	1.3	1.80
8......	1.00	1.90	9.60	1.80	3.50	1.80	1.02	.90	2.00	1.6	1.3	1.90
9......	1.00	1.90	9.30	1.80	3.10	1.80	1.00	.90	1.50	1.5	1.3	2.10
10......	1.00	1.80	8.20	1.80	3.00	1.70	1.00	.90	1.50	1.4	1.3	1.70
11......	1.00	1.70	5.70	1.70	2.80	1.70	1.00	1.00	1.40	1.4	1.4	1.70
12......	1.00	1.70	4.40	1.70	2.50	1.70	1.00	1.00	1.30	1.2	2.3	1.50
13......	1.00	1.70	4.00	1.60	2.50	1.70	.98	1.00	1.20	1.2	2.1	1.56
14......	1.00	1.70	3.80	1.60	2.30	1.60	1.00	1.00	1.15	1.2	1.9	1.43
15......	1.00	1.70	3.50	1.50	2.10	1.60	1.00	.99	1.10	1.2	1.9	1.42
16......	1.00	1.70	3.20	1.50	2.00	1.50	1.30	.98	1.20	1.1	1.9	1.49
17......	1.00	1.90	3.00	1.50	2.00	1.50	1.30	1.00	1.10	1.1	1.9	1.52
18......	1.20	2.40	2.90	1.70	2.00	1.40	1.10	1.00	1.05	1.1	1.9	1.33
19......	1.30	3.00	2.70	1.90	1.90	1.40	1.10	1.00	1.00	1.0	1.9	1.24
20......	1.60	3.00	2.70	2.80	1.90	1.40	1.10	1.00	1.02	1.0	1.9	1.32
21......	3.60	3.00	5.10	3.50	1.80	1.40	1.10	.98	1.02	1.0	1.8	1.51
22......	4.00	3.00	4.80	3.30	1.70	1.30	1.10	.97	1.00	1.0	1.7	1.52
23......	5.00	3.00	4.30	3.20	1.60	1.30	1.00	1.00	1.00	1.0	1.6	1.31
24......	5.10	3.00	4.20	3.30	1.70	1.30	1.00	1.00	1.00	1.0	1.6	1.24
25......	4.00	3.00	4.00	6.80	1.90	1.20	1.10	1.00	1.10	1.1	1.6	1.28
26......	3.60	3.00	4.00	7.60	2.00	1.20	1.10	.97	1.10	1.2	2.5	1.35
27......	3.20	3.00	3.50	8.20	2.00	1.20	1.10	.95	1.05	1.2	2.6	1.21
28......	2.80	3.00	3.00	8.20	2.00	1.10	1.05	.90	1.05	1.2	2.3	1.24
29......	2.60	......	2.70	6.80	1.90	1.10	1.00	.88	1.10	1.2	2.3	1.29
30......	2.20	......	2.50	6.50	1.90	1.10	1.00	.86	1.10	1.2	2.8	1.46
31......	2.00	......	2.30	......	1.80	......	1.00	.79	......	1.2	......	3.73

(*a*) The gage heights for July, August and September were observed by G. A. Bailey; for December they were taken by a recording gage, and for the rest of the year they were furnished by E. A. Fisher, City Engineer of Rochester.

Daily discharge, in second-feet, of Genesee River, at Elmwood avenue, Rochester, N. Y., for 1910.

DAY	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1......	320	1,600	13,200	1,960	11,400	1,300	405	320	174	610	500	(2,640)
2......	320	1,600	15,100	1,960	9,620	1,300	405	320	320	610	610	2,180
3......	320	1,600	21,400	1,600	13,200	1,300	405	320	320	610	610	(1,970)
4......	320	1,600	28,200	1,450	16,100	1,150	405	285	320	610	610	1,760
5......	320	1,600	29,000	1,450	15,800	1,150	405	285	320	610	610	1,620
6......	320	1,600	26,600	1,450	9,620	1,300	388	250	1,000	730	610	1,450
7......	320	1,600	24,700	1,300	5,800	1,300	362	250	1,960	1,000	610	1,300
8......	320	1,450	23,600	1,300	4,600	1,300	337	250	1,600	1,000	610	1,450
9......	320	1,450	22,500	1,300	3,720	1,300	320	250	860	860	610	1,780
10......	320	1,300	18,500	1,300	3,500	1,150	320	250	860	730	610	1,150
11......	320	1,150	10,500	1,150	3,100	1,150	320	320	730	730	730	1,150
12......	320	1,150	6,840	1,150	2,500	1,150	320	320	610	500	2,140	860
13......	320	1,150	5,800	1,000	2,500	1,150	306	320	500	500	1,780	944
14......	320	1,150	5,320	1,000	2,140	1,000	320	320	452	500	1,450	769
15......	320	1,150	4,600	860	1,780	1,000	320	313	405	500	1,450	756
16......	320	1,150	3,940	860	1,600	860	610	306	500	405	1,450	847
17......	320	1,450	3,500	860	1,600	860	610	320	405	405	1,450	888
18......	500	2,320	3,300	1,150	1,600	730	405	320	362	405	1,450	646
19......	610	3,500	2,900	1,450	1,450	730	405	320	320	320	1,450	544
20......	1,000	3,500	2,900	3,100	1,450	730	405	320	337	320	1,450	634
21......	4,840	3,500	8,780	4,600	1,300	730	405	306	337	320	1,300	874
22......	5,800	3,500	7,940	4,160	1,150	610	405	299	320	320	1,150	888
23......	8,500	3,500	6,580	3,940	1,000	610	320	320	320	320	1,000	622
24......	8,780	3,500	6,320	4,160	1,150	610	320	320	320	320	1,000	544
25......	5,800	3,500	5,800	13,900	1,450	500	405	320	405	405	1,000	588
26......	4,840	3,500	5,800	16,400	1,600	500	405	306	405	500	2,500	670
27......	3,940	3,500	4,600	18,500	1,600	500	405	285	362	500	2,700	511
28......	3,100	3,500	3,500	18,500	1,600	405	362	250	362	500	2,140	544
29......	2,700	......	2,900	13,900	1,450	405	320	238	405	500	2,140	599
30......	1,960	......	2,500	12,900	1,450	405	320	226	405	500	3,100	808
31......	1,600	......	2,140	......	1,300	......	320	186	......	500	......	5,150

NOTE.— Daily discharge for open channel periods based on a well defined rating. Discharge during the periods of ice conditions based on measurements made under ice cover and the discharge at other Genesee river stations.

Monthly discharge of Genesee River at Elmwood avenue, Rochester. N. Y., for 1910.

[Drainage area 2,360 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	8,780	320	1,920	.814	.94	B
February	3,500	1,150	2,180	.924	.96	B
March	29,000	2,140	10,600	4.49	5.18	B
April	18,500	860	4,620	1.96	2.19	B
May	16,100	1,000	4,130	1.75	2.02	B
June	1,300	405	906	.384	.43	B
July	610	320	379	.161	.19	B
August	320	186	291	.123	.14	B
September	1,960	174	533	.226	.25	B
October	1,000	320	537	.228	.26	B
November	3,100	500	1,290	.547	.61	B
December	5,150	511	1,160	.492	.57	B
The year	29,000	174	2,390	1.01	13.74	

CANASERAGA CREEK DRAINAGE BASIN.

Description.

Canaseraga creek, one of the most important tributaries to the Genesee river from the East, rises in the extreme northwestern corner of Steuben county and flows in a northwestern direction to its junction with the Genesee river, a short distance below the village of Mt. Morris.

Through its entire course, the creek flows through a flat, fertile valley, devoted almost entirely to the pursuit of agriculture. From the village of Dansville to Mt. Morris, a distance of 22½ miles, the river winds back and forth across the valley. The velocity is so slow that the large amount of silt which is brought down from the foot hills by the smaller streams is deposited in the creek bed, raising it to an elevation higher, in many cases, than the surrounding country. The deposit of silt coupled with the extreme deviation of the creek from a straight line, causes the 11.000 acres, which border on the stream, below Dansville to become annually inundated by the flood waters. The State Water Supply Commission, acting upon the petition of the people residing in the vicinity, and under the authority acquired in 1906 when the duties of the River Improvement Commission were transferred to them, have sold bonds to the extent of $200,000 and work is now being started which is expected to alleviate much of the damage caused by flooding.

Canaseraga Creek at Dansville, N. Y.

This station is located at the highway bridge one mile due west from the village of Dansville and about 22 miles above the mouth of the stream.

It was established July 21, 1910, in co-operation with the U. S. Geological Survey to obtain data in regard to the flow of this stream and to aid in a general way the studies being made of the flow of the Genesee river.

A staff gage is bolted to the down-stream, left-hand wing wall and is read twice daily. Low water measurements are made by wading below the bridge and high water measurments will be made from the bridge. The bed of the stream at this point is composed of sand and gravel and may shift during high water.

The rating curve is not yet sufficiently developed to warrant publishing the discharge so only discharge measurements and gage heights are published.

Discharge measurements of Canaseraga Creek at Dansville, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 21	W. G. Hoyt	42	22.7	1.25	1.75	(*a*)27.3
Aug. 21	C. C. Covert	43	29.6	1.22	1.72	(*a*)36 0
Oct. 26	F. J. Shuttleworth	44	22.6	1.36	1.80	(*a*)30.7

(*a*) Measurement made at wading section.

Daily gage height in feet of Canaseraga Creek at Dansville, N. Y., for 1910.
[Floyd Harter, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.75	1.82	1.75	1.78	1.92	17	.....	1.75	1.75	1.72	1.82	.....
2	.....	1.75	1.75	1.70	1.80	1.98	18	.....	1.78	1.75	1.72	1.82	.....
3	.....	1.78	1.88	1.70	1.75	2.08	19	.....	1.85	1.78	1.68	1.92	.....
4	.....	1.78	1.80	1.68	1.80	2.02	20	.....	1.78	1.75	1.68	1.88	.....
5	.....	1.75	1.75	1.68	1.80	2.00	21	1.75	1.75	1.72	1.72	1.82	.....
6	.....	1.75	1.85	1.75	1.80	1.92	22	1.72	1.75	1.72	1.75	1.80	.....
7	.....	1.78	1.78	1.95	1.78	1.90	23	1.75	1.72	1.72	1.72	1.85	.....
8	.....	1.75	1.75	1.78	1.78	1.82	24	1.78	1.70	1.85	1.75	1.80	.....
9	.....	1.75	1.78	1.75	1.90	1.88	25	1.75	1.72	1.78	1.88	2.08	.....
10	.....	1.92	1.75	1.75	2.02	1.85	26	1.75	1.82	1.75	1.82	2.02	.....
11	.....	1.82	1.72	1.72	2.15	.....	27	1.75	1.75	1.75	1.82	1.95	.....
12	.....	1.75	1.72	1.75	1.92	.....	28	1.80	1.75	1.72	1.80	2.05	.....
13	.....	1.75	1.72	1.72	1.80	.....	29	1.75	1.72	1.72	1.82	2.00	.....
14	.....	1.75	1.75	1.70	1.82	.....	30	1.85	1.72	1.75	1.80	1.92	.....
15	.....	1.72	1.72	1.72	1.80	.....	31	1.75	1.72	.....	1.82	.....	.....
16	.....	1.72	1.72	1.70	1.85	.....							

NOTE.— Ice conditions prevailed December 10–31. No gage heights for this period.

Canaseraga Creek at Shakers' Crossing, N. Y.

Measurements have been made from the highway bridge at Shakers' Crossing, about one-half mile above the junction of Canaseraga creek with Genesee river.

Owing to the fact that during any flood period the water is backed up from the Genesee river, no gage has been installed at this place, but measurements have been referred to a reference point and are here published under one head.

The reference point to which these measurments have been referred is the top of the horizontal tie bar 20 feet from the left-hand abutment, downstream side of bridge.

Discharge measurements of Canaseraga Creek at Shakers' Crossing, near Mt. Morris, N.Y., 1904–1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
1904.						
April 12	R. E. Horton	......	......	....	7.58	1,050
July 16	C. C. Covert	....	....	....	3.8	242
1905.						
Mar. 24	C. C. Covert	100	1,450	1.47	18.88	(*b*)2,010
Mar. 30	C. C. Covert	100	772	3.72	12.32	2,880
Mar. 31	C. C. Covert	90	546	3.87	9.88	2,120
April 1	C. C. Covert	82	374	3.86	7.88	1,440
Aug. 25	C. C. Covert	60	92	2.73	3.72	252
1906.						
Mar. 29	C. C. Covert	84	500	3.76	9.22	1,880
Mar. 30	C. C. Covert	84	456	3.55	8.90	1,620
Mar. 31	C. C. Covert	94	900	1.86	13.55	(*b*)1,670
April 2	C. C. Coveryt	81	368	3.89	7.85	1,430
April 3	C. C. Covert	75	310	3.71	7.00	1,150
April 21	C. C. Covert	66	142	3.37	4.45	478
1910.						
April 20	C. C. Covert	86	278	....	6.29	594
July 20	W. G. Hoyt	66	126	....	3.90	270
Aug. 22	C. C. Covert	34	16.9	....	2.52	(*c*)36.6
Oct. 26	F. J. Shuttleworth	63	135	....	3.84	260

(*a*) Gage datum is 25 feet below reference point on horizontal tie-bar 20 feet from left hand end down stream side of bridge.
(*b*) Back water from Genesee river.
(*c*) Made by wading below bridge.

KESHEQUA CREEK DRAINAGE BASIN.

Description.

Keshequa creek, the principal tributary to Canaseraga creek, has its source among the hills of northern Allegheny county and flows north and northeast through Nunda and Tuscarora joining Canaseraga creek near Sonyea, the home of the Craig Colony for epileptics. Throughout its length of some 20 miles it flows through a narrow valley and falls about 1,200 feet. No power is developed as the flow during the summer averages only 3 to 6 second-feet. The yearly rain fall is a little above the average for the Genesee Valley and ranges from 28 to 36 inches.

Keshequa Creek at Sonyea, N. Y.

This station is located at the upper highway bridge in the village and about two miles above the mouth of the stream. It was installed to aid in the studies of the flow of Canaseraga creek and to obtain data in regard to the run-off of small drainage areas in the western part of the State.

A staff gage was installed July 22, 1910, in co-operation with the U. S. Geological Survey. This gage is fastened to a pile, located on the right-hand bank between the two bridges, directly back and across from the Craig Colony power house. This gage is intended only for the low-water periods of the year as on October 25, a chain gage was installed on the up-stream side of the upper bridge. Discharge measurements are made by wading. Either bridge may be used during high water.

The bed of the creek is composed of gravel and sand and the channel shifts back and forth from year to year. The rating curve is not developed as yet and only gage heights and discharge measurements are published.

Discharge measurements at Keshequa Creek at Sonyea, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.*	Discharge.
1910.		*Feet.*	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 22......	W. C. Hoyt................	18	6.16	.424	0.55	(*a*)2.61
Aug. 26......	C. C. Covert...............	8.6	2.6	.75	0.52	(*a*)1.96
Oct. 25......	W. C. Hoyt................	22	8.6	.58	(*b*)0.61	(*a*)4.99

* Staff gage.
(*a*) Measurement made at wading section.
(*b*) Chain gage read 3.46.

Daily gage height in feet, of Keshequa Creek at Sonyea, N. Y., for 1910.
[Elmer E. Reynolds, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1........	.....	.55	.65	.55	.65	.95	17.....	.....	.60	.60	.55	.75	.....
2........	.....	.62	.60	.55	.65	.85	18.....	.....	.62	.60	.55	.75	.....
3........	.....	.58	.65	.55	.70	.80	19.....	.....	.75	.60	.55	.75	.....
4........	.....	.55	.65	.55	.68	.75	20.....	.....	.70	.62	.55	.70	.....
5........	.....	.55	.68	.55	.65	.80	21.....	.....	.62	.65	.55	.75	.....
6........	.....	.58	.68	.62	.65	.80	22.....	.55	.60	.65	.58	.75	.....
7........	.....	.55	.65	.80	.65	.80	23.....	.58	.60	.65	.60	.70	.....
8........	.....	.55	.68	.80	.70	.80	24.....	.55	.60	.60	.60	.70	.....
9........	.....	.58	.68	.75	.70	.80	25.....	.55	.60	.60	.60	.82	.....
10........	.....	.62	.60	.68	.80	.....	26.....	.58	.58	.60	.60	.85	.....
11........	.....	.72	.60	.65	.85	.....	27.....	.55	.65	.60	.60	.82	.....
12........	.....	.65	.60	.65	.80	.....	28.....	.55	.60	.55	.65	.80	.....
13........	.....	.62	.62	.65	.80	.....	29.....	.55	.60	.55	.65	.88	.....
14........	.....	.58	.62	.60	.78	.....	30.....	.55	.58	.55	.65	.88	.....
15........	.....	.55	.60	.55	.80	.....	31.....	.55	.60	.....	.65	.....	.....
16........	.....	.55	.60	.55	.78	.....							

NOTE.—Readings discontinued December 9 on account of ice conditions.

SALMON RIVER DRAINAGE BASIN.

Description.

Salmon River rises in the southwestern part of Lewis county, N. Y. and flows southward and then northward, entering Lake Ontario near Port Ontario. Its drainage area comprises about 285 square miles. The topography is generally rolling in character, and the soil is sandy, rock lying near the surface in the upper part of the basin, where there are extensive tracts of virgin forest.

The mean annual precipitation is about 35 inches, and during the winter there is usually a heavy fall of snow, which often accumulates in the forest areas to a depth of several feet. The gradual melting of this snow, in the spring, tends to prevent high freshets.

The basin affords several opportunities for storage. At High Falls there is an undeveloped fall of about 110 feet, occurring in a very short distance. Considering its size, this river has rather important power possibilities.

A gaging station has been maintained in this river basin near Pulaski from 1900 to 1908 and 1910.

Salmon River at Fox's Bridge, near Pulaski, N. Y.

This station is located on the first highway bridge above the village of Pulaski and was established by the U. S. Geological Survey, September 5, 1900. A vertical staff gage was attached to the up-stream end of the center pier, with its zero 11.59 feet below the bench mark, which is the top of the cap stone of the center pier.

This gage was removed by ice during the winter of 1901–1902 and then replaced July 23, 1902, by a chain gage, having its zero 12.79 feet below the original bench mark. The station was discontinued June 30, 1907, re-established August 16, 1908, and discontinued December 6, 1908. It was maintained during these periods in co-operation with the State Engineer and Surveyor of the State of New York.

On July 14, 1910, it was re-established by the survey in co-operation with the State Water Supply Commission of New York, for the purpose of obtaining general statistical data regarding the flow of Salmon river. The gage datum has remained permanent since July 23, 1902. Discharge measurements are made from the bridge or by wading.

The station can be reached by a short drive from either Pulaski or Richland. Conditions are poor for records during the winter, when the channel usually becomes clogged by ice. The open channel rating is fairly good.

Information regarding this station is contained in the reports of the State Engineer and Surveyor, State of New York, and in the annual reports of the U. S. Geological Survey.

Discharge measurements of Salmon River at Fox's Bridge near Pulaski, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 13	W. G. Hoyt	168	239	704	2.61	168
Aug. 25	W. G. Hoyt	169	234	774	2.61	(*a*)181

(*a*) Measurement made at wading section.

Daily gage height in feet, of Salmon River at Fox's Bridge, near Pulaski, N. Y., for 1910.

[Seynour J. Fox, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.50	3.47	2.58	3.10	3.20	17	2.72	2.85	2.65	2.62	3.42	3.30
2	.....	2.50	3.60	2.58	3.10	3.18	18	2.70	2.80	2.50	2.60	3.35	.....
3	.....	2.62	3.12	2.50	3.70	3.10	19	2.50	3.28	2.50	2.60	3.28	.....
4	.....	2.58	3.75	2.48	3.55	3.10	20	2.48	3.38	2.60	2.60	3.25	.....
5	.....	2.88	3.50	2.92	3.50	3.02	21	2.52	2.98	2.50	2.55	3.10	.....
6	.....	3.50	3.70	4.05	3.42	2.90	22	2.50	2.72	2.55	2.55	3.30	.....
7	.....	3.90	3.72	4.10	3.50	2.90	23	2.62	2.75	2.45	2.68	3.28	.....
8	.....	3.15	3.25	3.65	3.38	2.90	24	2.65	2.60	2.50	3.00	3.35	.....
9	.....	2.90	3.05	3.20	3.38	3.00	25	2.55	2.60	2.65	2.98	3.50	.....
10	.....	2.92	3.00	3.12	3.65	3.00	26	2.55	2.75	2.60	3.75	3.48	.....
11	.....	3.85	2.70	3.00	4.80	3.00	27	2.50	2.90	2.68	3.58	3.38	.....
12	.....	3.62	2.78	3.88	4.30	3.00	28	2.60	2.82	2.62	3.52	3.30	.....
13	.....	3.35	2.60	2.78	4.02	3.10	29	2.55	2.62	2.62	3.52	3.28	.....
14	2.78	2.85	2.62	2.70	3.75	3.05	30	2.50	2.50	2.68	3.38	3.28	.....
15	2.55	2.72	2.70	2.70	3.60	3.00	31	2.60	2.65	.....	3.22	....	.....
16	2.58	2.62	2.60	2.68	3.52	3.00							

NOTE.—Ice conditions prevailed December 17–31. Gage heights discontinued during this period.

Daily discharge in second-feet, of Salmon River at Fox's Bridge, near Pulaski, N. Y., for 1910.

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	140	676	172	420	480	17	229	290	200	188	636	....
2	.....	140	780	172	420	468	18	220	265	140	180	582	....
3	.....	188	432	140	870	420	19	140	532	140	180	532	....
4	.....	172	920	133	740	420	20	133	605	180	180	512	....
5	.....	305	700	325	700	376	21	148	355	140	160	420	....
6	.....	700	870	1,240	636	315	22	140	229	160	160	545	....
7	.....	1,070	890	1,300	700	315	23	188	242	122	212	532	....
8	.....	450	512	825	605	315	24	200	180	140	365	582	....
9	.....	315	392	480	605	365	25	160	180	200	355	700	....
10	.....	325	365	432	825	365	26	160	242	180	920	684	....
11	.....	1,020	220	365	2,420	365	27	140	315	212	764	605	....
12	.....	798	256	1,050	1,570	365	28	180	275	188	716	545	....
13	.....	582	180	256	1,200	420	29	160	188	188	716	532	....
14	256	290	188	220	920	392	30	140	140	212	605	532	....
15	160	229	220	220	780	365	31	180	200	.....	493	.....	....
16	172	188	180	212	716	365							

NOTE.—Ice conditions prevailed December 17–31.

Monthly discharge of Salmon River at Fox's Bridge near Pulaski, N. Y., for 1910.
[Drainage area, 264 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
July 14–31	256	133	173	.655	.44	B
August	1,070	140	360	1.36	1.57	B
September	920	122	340	1.29	1.44	B
October	1,300	133	443	1.68	1.94	B
November	2,420	420	736	2.79	3.11	B
December 1–16	480	315	382	1.45	.86	B

BLACK RIVER DRAINAGE BASIN.

Description.

Black river rises in the western part of Hamilton county, N. Y., flows southwestward across Herkimer county into Oneida county, turns near Forestport and runs somewhat west of north through Lewis county to eastern Jefferson county, and then flows westward to Black River bay, at the eastern extremity of Lake Ontario. Its total drainage area is 1,930 square miles. The upper part of the basin is very rugged and mountainous, contains a large number of lakes, and is in a part of the Adirondack forest.

The mean annual precipitation is about 40 inches, ranging from 55 inches in the extreme headwaters to perhaps 30 inches near Lake Erie. The winters are generally quite severe, and the stream flow is affected by ice for periods of several months.

The regimen of the river is controlled by storage on its upper tributaries (including Beaver river at Beaver), a series of reservoirs at the headwaters of Moose river, and additional reservoirs at Forestport and on the headwaters of the main river.

Water is diverted from Black river through Forestport feeder to supply the Black River canal at Boonville. A portion of this diverted water flows northward from Boonville and enters Black river again at Lyons Falls; the remainder flows southward through the Black River canal and enters the Erie canal at Rome.

A discharge measurement of Black river was made by C. C. Covert September 23, 1910, at a point 1,000 feet above the first highway bridge below Hawkinsville and about two miles northwest of Boonville. Discharge 80.7 second-feet. This does not include the division through Forestport feeder to Black River canal.

Moose River at Moose River, N. Y.

This station is located in the village of Moose River, about three miles down-stream from the McKeever station on the Adirondack division of the N. Y. C. R. R. It was established June 5, 1900, to obtain general statistical data regarding the flow.

At McKeever is a timber dam used for power and water regulation for log-driving purposes so that during portions of the year two gage readings a day may not give a good mean. From the dam down to the station the velocity is relatively slow but below the station it is very high. Just above the station is a small island upon which ice and log jams occasionally form.

At the station the bed of the river is cobble, with occasional large boulders. the current is smooth, and the depth fairly uniform. The stream freezes over in winter, alternate layers of ice and snow forming in such a way as to render the computations of discharge during the frozen period of the year impossible.

In July, 1903, a cable having a clear span of 269 feet was erected and since that time current meter measurements have been made from this. A staff gage divided into two parts is located on the left bank a short distance above the cable. The elevation of the gage zero was changed on February 28, 1903, from 15.36 to 15.53. A fairly accurate rating curve has been developed for the open water channel.

Information regarding this station may be found in the annual reports of the Engineer and Surveyor, State of New York, and in the annual reports of the U. S. Geological Survey.

Discharge measurements of Moose River at Moose River, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
May 12......	W. G. Hoyt................	218	768	1.12	2.51	862
July 11......	J. J. Phelan................	204	413	.63	.88	260

Daily gage height, in feet, of Moose River at Moose River, N. Y., for 1910.
[Chris. Hannan, observer.]

DAY.	Jan.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1	1.10	7.10	6.20	4.30	2.40	.90	.95	.85	3.10	2.50	1.30
2	1.00	6.95	6.10	4.20	2.90	.95	.95	.80	2.85	2.50	1.20
3	1.00	6.50	5.95	4.20	3.25	.90	.95	.70	2.80	2.60	1.35
4	1.25	5.65	5.80	4.10	2.90	1.00	2.40	.80	2.70	2.60	.00
5	1.35	5.10	5.20	4.20	2.90	1.10	4.10	.80	2.55	2.65	1.45
6	1.55	4.80	5.05	4.35	3.20	1.20	3.20	.90	2.40	2.65	1.70
7	1.70	4.80	5.35	4.05	3.55	1.10	2.95	1.05	2.25	2.60	1.60
8	1.70	4.70	5.10	3.75	3.75	.95	2.65	1.40	2.20	2.45	1.35
9	.....	4.80	4.35	3.40	3.70	1.00	2.30	1.35	2.05	2.35	.95
10	.....	4.80	3.90	3.10	3.55	.90	2.45	1.30	2.00	2.30	.80
11	.....	4.65	3.35	2.80	3.25	.90	3.00	1.30	1.90	2.20	.80
12	.....	4.50	3.15	2.45	3.20	.80	3.35	1.40	1.80	2.10	.70
13	.....	4.35	3.00	2.10	2.90	.80	3.10	1.35	1.65	2.10	.70
14	.....	4.30	2.95	1.60	2.40	.80	2.70	1.45	1.60	2.00	.80
15	.....	4.20	2.75	.30	2.20	.80	2.60	1.45	1.60	2.00	.80
16	.....	4.00	2.70	1.20	2.05	.80	2.50	1.30	.00	1.90	.90
17	.....	3.55	2.70	1.40	2.00	.30	2.35	1.40	1.60	1.75	.80
18	.....	3.30	2.60	1.65	1.90	.80	2.15	1.40	1.60	1.70	.70
19	.....	3.10	2.60	2.00	1.80	.90	2.00	1.25	1.70	1.60	.70
20	.....	2.85	2.50	2.30	1.70	.80	1.95	1.20	1.80	1.50	.80
21	.....	2.60	2.50	2.45	1.60	.80	1.80	1.30	1.95	1.50	.80
22	.....	2.85	2.40	2.70	1.50	.70	1.65	1.30	1.95	1.50	.70
23	.....	3.30	2.40	3.00	1.30	.70	1.45	1.40	2.00	1.50	.80
24	.....	4.05	2.40	3.25	.30	.80	1.20	1.40	2.15	1.60	.90
25	.....	5.65	2.40	2.95	1.15	.90	.95	1.50	2.35	1.50	.95
26	.....	6.35	3.10	2.90	1.15	.95	.75	1.50	2.55	1.50	.80
27	.....	6.35	3.85	2.80	1.10	.90	.55	1.65	2.35	1.40	1.25
28	.....	5.95	3.80	2.70	1.05	.80	.00	1.95	2.30	1.40	1.70
29	.....	6.30	3.95	2.55	1.00	.75	.60	2.40	2.20	1.40	1.75
30	.....	6.15	4.25	2.35	.90	.90	.95	3.05	2.35	1.30	1.60
31	.....	6.15	.....	2.20	.....	1.05	.90	.....	2.40	.....	1.45

NOTE.— Gage readings discontinued Jan. 8–Feb. 28. River frozen over.

Daily discharge, in second-feet, of Moose River at Moose River, N. Y., for 1910.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,060	4,660	2,240	800	265	278	252	1,220	855	375
2	5,820	4,510	2,140	1,080	278	278	240	1,060	855	345
3	5,110	4,280	2,140	1,320	265	278	215	1,020	910	390
4	3,860	4,070	2,040	1,080	290	800	240	965	910	90
5	3,140	3,260	2,140	1,080	315	2,040	240	882	938	420
6	2,780	3,080	2,290	1,290	345	1,290	265	800	938	500
7	2,780	3,460	1,990	1,550	315	1,120	302	725	910	465
8	2,670	3,140	1,720	1,720	278	938	405	700	828	390
9	2,780	2,290	1,430	1,670	290	750	390	630	775	278
10	2,780	1,850	1,220	1,550	265	828	375	610	750	240
11	2,620	1,400	1,020	1,320	265	1,150	375	570	700	240
12	2,450	1,260	828	1,290	240	1,400	405	535	650	215
13	2,290	1,150	650	1,080	240	1,220	390	482	650	215
14	2,240	1,120	465	800	240	965	420	465	610	240
15	2,140	995	135	700	240	910	420	465	610	240
16	1,940	965	345	630	240	855	375	90	570	265
17	1,550	965	405	610	135	775	405	465	518	240
18	1,360	910	482	570	240	675	405	465	500	215
19	1,220	910	610	535	265	610	360	500	465	215
20	1,060	855	750	500	240	590	345	535	435	240
21	910	855	828	465	240	535	375	590	435	240
22	1,060	800	965	435	215	482	375	590	435	215
23	1,360	800	1,150	375	215	420	405	610	435	240
24	1,990	800	1,320	135	240	345	405	675	465	265
25	3,860	800	1,120	330	265	278	435	775	435	278
26	4,880	1,220	1,080	330	278	228	435	882	435	240
27	4,880	1,800	1,020	315	265	185	482	775	405	340
28	4,280	1,760	965	302	240	90	590	750	405	500
29	4,810	1,900	882	290	228	195	800	700	405	518
30	4,580	2,190	775	265	265	278	1,180	775	375	465
31	4,580	......	700	......	302	265	......	800	......	420

NOTE.— Ice conditions Jan. 1–Feb. 28. December may be somewhat in error due to ice conditions.

Monthly discharge of Moose River at Moose River, N. Y., for 1910.
[Drainage area, 346 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
March	6,060	910	3,030	8.76	10.10	C
April	4,660	800	1,940	5.61	6.26	B
May	2,290	135	1,160	3.35	3.86	B
June	1,720	135	814	2.35	2.62	A
July	345	135	258	.746	.86	A
August	2,040	90	679	1.96	2.26	A
September	1,180	215	410	1.18	1.32	A
October	1,220	90	681	1.97	2.27	A
November	938	375	680	1.79	2.00	B
December	518	90	308	.890	1.03	D

ST. LAWRENCE RIVER DRAINAGE BASIN.

General Features.

St. Lawrence river, the outlet of the Great Lakes system, receives also the flow of a number of New York streams having their sources in the northerly slopes of the Adirondacks and fed by the innumerable lakes with which the region is dotted. Some of these rivers, as the Grass, Raquette, and St. Regis, lie entirely within the United States; others, notably Salmon, Trout, Chateaugay, and English rivers, cross the international boundary and flow northward into the St. Lawrence in Canada, as does also Richelieu river, the outlet of Lake Champlain. The following tables gives a list of the principal tributaries of the St. Lawrence in the United States, with the areas drained by them:

Drainage areas of St. Lawrence River tributaries in the United States.

	Square miles.		Square miles.
Oswegatchie River	1,609	Salmon River[a]	273
Grass River	637	Trout River[b]	129
Raquette River	1,219	Chateaugay River[b]	199
St. Regis River	910	English River[b]	53
Little Salmon River[a]	103	Lake Champlain[b]	8,187

The St. Lawrence drains, through Lake Champlain, an area of about 4,560 square miles in the State of Vermont. This drainage is practically all from Missisquoi, Lamoille, and Winooski rivers and Otter creek. Clyde Barton, and Black rivers, in northern Vermont, are tributary to St. Lawrence river through Lake Memphremagog and St. Francis river.

Oswegatchie River near Ogdensburg, N. Y.

This station, which is located at what is known as the Eel Weir highway bridge, about six miles upstream from Ogdensburg, N. Y., and one-half mile below Black Lake outlet, was established May 16, 1903, and has been maintained continuously since that date to obtain information for use in studies of power and storage development on Oswegatchie and Black rivers.

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[a] Above junction near international boundary.
[b] Above New York state line.

There are three dams in the vicinity of the gaging station on Oswegatchie river — one at Heuvelton, about 5 miles above; one at Rensselaer Falls, 10 miles above; and one in the city of Ogdensburg, about one-half mile above the outlet.

Open-water conditions prevail at this station throughout the year. The stream bed is rocky and permanent and the results are considered fairly good for all stages. The datum of the chain gage attached to the bridge has remained the same since the beginning of the record.

Information in regard to this station is contained in the annual reports of the New York State Engineer and Surveyor, and reports of the United States Geological Survey.

Discharge measurements of Oswegatchie River at Eel Weir bridge, near Ogdensburg, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Aug. 24......	W. G. Hoyt................	150	297	2.35	4.73	696

Daily gage height, in feet, of Oswegatchie River, at Eel Weir bridge, near Ogdensburg, N. Y., for 1910.

[Joseph La Rue, observer.]

DAY.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.................	5.1	6.1	5.7	6.9	5.3	5.4	4.7	4.4	4.6	4.7	5.8	5.9
2.................	5.0	6.0	6.2	6.7	5.3	5.4	4.7	4.5	4.6	4.7	6.0	5.8
3.................	5.0	5.8	7.0	6.7	5.3	5.3	4.7	4.5	4.6	4.7	5.8	5.8
4.................	5.2	5.8	7.5	6.7	5.3	5.3	4.8	4.5	4.6	4.7	5.7	5.8
5.................	5.0	5.6	8.1	6.7	5.4	5.3	4.8	4.5	4.6	4.7	5.7	5.8
6.................	5.0	5.5	8.3	6.5	5.6	5.4	4.7	4.5	4.7	4.7	5.6	5.8
7.................	4.9	5.5	8.8	6.5	6.2	5.3	4.7	4.5	4.9	4.7	5.6	5.7
8.................	4.9	5.5	8.9	6.2	6.1	5.2	4.7	4.6	4.9	4.8	5.6	5.7
9.................	4.9	5.3	9.1	6.2	6.1	5.2	4.7	4.5	4.9	4.9	5.6	5.6
10.................	5.0	5.2	9.1	6.1	5.9	5.2	4.6	4.6	4.9	4.9	5.6	5.5
11.................	5.0	5.1	9.0	6.0	5.9	5.2	4.6	4.6	4.9	5.0	6.0	5.4
12.................	4.9	5.1	8.6	5.9	5.9	5.5	4.6	4.7	4.9	5.2	6.0	5.3
13.................	4.9	5.1	8.5	5.9	5.7	5.5	4.7	4.7	5.0	5.2	6.1	5.3
14.................	4.8	5.0	8.3	5.8	5.6	5.3	4.7	4.7	4.9	5.3	6.2	5.2
15.................	4.8	5.0	7.9	5.6	5.6	5.3	4.7	4.7	5.0	5.3	6.3	5.2
16.................	4.8	5.0	7.6	5.6	5.5	5.3	4.6	4.7	4.9	5.3	6.3	5.1
17.................	4.8	4.9	7.3	5.4	5.4	5.3	4.6	4.7	4.9	5.3	6.2	5.1
18.................	4.8	4.9	6.9	5.4	5.3	5.1	4.6	4.7	4.9	5.3	6.1	5.1
19.................	4.8	4.9	6.6	5.4	5.2	5.1	4.6	4.6	4.9	5.2	6.0	5.1
20.................	5.0	4.9	6.6	5.6	5.1	5.1	4.4	4.6	4.9	5.2	6.0	5.0
21.................	5.0	4.9	6.6	5.6	5.3	5.1	4.4	4.7	4.8	5.2	6.0	5.0
22.................	5.2	4.9	6.6	5.6	5.3	5.1	4.4	4.7	4.8	5.1	6.0	5.0
23.................	5.5	5.0	6.6	5.6	5.3	5.1	4.5	4.7	4.8	5.1	5.9	5.0
24.................	6.0	5.0	6.6	5.6	5.3	5.0	4.5	4.6	4.8	5.0	5.9	5.0
25.................	6.2	5.0	6.8	5.5	5.4	5.0	4.5	4.6	5.0	5.0	5.8	5.0
26.................	6.4	5.0	6.8	5.6	5.5	5.0	4.5	4.6	4.9	5.0	5.8	5.0
27.................	6.4	5.0	6.9	5.6	5.5	5.0	4.5	4.6	4.9	5.0	5.8	5.0
28.................	6.5	5.2	7.1	5.3	5.4	4.9	4.5	4.6	4.8	5.2	5.9	5.1
29.................	6.4	.....	7.1	5.3	5.5	4.8	4.5	4.6	4.8	5.3	6.0	5.1
30.................	6.3	.....	7.1	5.3	5.5	4.8	4.5	4.6	4.8	5.5	6.0	5.1
31.................	6.1	.....	7.2	.....	5.4	.....	4.4	4.6	.....	5.8	.....	5.2

Daily discharge, in second-feet, of Oswegatchie River at Eel Weir bridge, near Ogdensburg, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,380	3,730	2.640	6,070	1,770	1,970	720	330	580	720	2,890	3,160
2	1,200	3,440	4,020	5,480	1,770	1,970	720	450	580	720	3,440	2,890
3	1,200	2,890	6,360	5,480	1,770	1,770	720	450	580	720	2,890	2,890
4	1,570	2,890	7,850	5,480	1,770	1,770	870	450	580	720	2,640	2,890
5	1,200	2,400	9,660	5,480	1,970	1,770	870	450	580	720	2,640	2,890
6	1,200	2,180	10,300	4,890	2,400	1,970	720	450	720	720	2,400	2,890
7	1,030	2,180	11,800	4,890	4,020	1,770	720	450	1,030	720	2,400	2,640
8	1,030	2,180	12,100	4,020	3,730	1,570	720	580	1,030	870	2,400	2,640
9	1,030	1,770	12,700	4,020	3,730	1,570	720	450	1,030	1,030	2,400	2,400
10	1,200	1,570	12,700	3,730	3,160	1,570	580	580	1,030	1,030	2,400	2,180
11	1,200	1,380	12,400	3,440	3,160	1,570	580	580	1,030	1,200	3,440	1,970
12	1,030	1,380	11,200	3,160	3,160	2,180	580	720	1,030	1,570	3,440	1,770
13	1,030	1,380	10,900	3,160	2,640	2,180	720	720	1,200	1,570	3,730	1,770
14	870	1,200	10,300	2,890	2,400	1,770	720	720	1,030	1,770	4,020	1,570
15	870	1,200	9,050	2,400	2,400	1,770	720	720	1,200	1,770	4,310	1,570
16	870	1,200	8,150	2,400	2,180	1,770	580	720	1,030	1,770	4,310	1,380
17	870	1,030	7,250	1,970	1,970	1,770	580	720	1,030	1,770	4,020	1,380
18	870	1,030	6,070	1,970	1,770	1,380	580	720	1,030	1,770	3,730	1,380
19	870	1,030	5,180	1,970	1,570	1,380	580	580	1,030	1,570	3,440	1,380
20	1,200	1,030	5,180	2,400	1,380	1,380	330	580	1,030	1,570	3,440	1,200
21	1,200	1,030	5,180	2,400	1,770	1,380	330	720	870	1,570	3,440	1,200
22	1,570	1,030	5,180	2,400	1,770	1,380	330	720	870	1,380	3,440	1,200
23	2,180	1,200	5,180	2,400	1,770	1,380	450	720	870	1,380	3,160	1,200
24	3,440	1,200	5,180	2,400	1,770	1,200	450	580	870	1,200	3,160	1,200
25	4,020	1,200	5,780	2,180	1,970	1,200	450	580	1,200	1,200	2,890	1,200
26	4,600	1,200	5,780	2,400	2,180	1,200	450	580	1,030	1,200	2,890	1,200
27	4,600	1,200	6,070	2,400	2,180	1,200	450	580	1,030	1,200	2,890	1,200
28	4,890	1,570	6,660	1,770	1,970	1,030	450	580	870	1,570	3,160	1,380
29	4,600	......	6,660	1,770	2,180	870	450	580	870	1,770	3,440	1,380
30	4,310	......	6,660	1,770	2,180	870	450	580	870	2,180	3,440	1,380
31	3,730	......	6,960	......	1,970	......	330	580	......	2,890	......	1,570

Monthly discharge of Oswegatchie River, Eel Weir bridge, near Ogdensburg, N. Y., for 1910.

[Drainage area, 1580 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	4,890	870	1,960	1.24	1.43	B
February	3,730	1,030	1,670	1.06	1.10	B
March	12,700	2,640	7,780	4.92	5.67	A
April	6,070	1,770	3,240	2.05	2.29	A
May	4,020	1,380	2,270	1.44	1.66	A
June	2,180	870	1,550	.981	1.09	A
July	870	330	578	.366	.42	A
August	720	330	588	.372	.43	A
September	1,200	580	924	.585	.65	A
October	2,890	720	1,350	.854	.98	A
November	4,310	2,400	3,210	2.03	2.26	B
December	3,160	1,200	1,840	1.16	1.34	B
The year	12,700	330	2,250	1.42	19.32	

RAQUETTE RIVER DRAINAGE BASIN.

Description.

Raquette river rises in northern Hamilton county, flows practically north through a long narrow valley to St. Lawrence river. It has a total length of 162 miles, from its source to its confluence with the St. Lawrence, near the most northern point of the state.

Its source is on an elevated plateau of some 1,600 feet above sea level. The upper water-shed includes many acres of swamp land, as well as a large area of lakes and ponds, including Tupper lake, Little Tupper lake, Long lake, Round lake, Blue Mountain lake, Forked lake and Raquette lake.

The high region is most prolific in rain-fall, the mean annual amounting to about 48 inches, or about 10 inches above the mean for the State.

In its course through the mountains the river exhibits many falls and rapids, inviting power development under private enterprise. As yet, however, only 400 feet of the 1,400 feet of fall in the river, below Tupper lake, has been developed. The river has tremendous fluctuations between the maximum and minimum flow and is in great need of artificial regulation if the best possibilities of power development are to be realized. The State Water Supply Commission of New York have under consideration extensive storage developments on this stream which, when completed, will materially benefit the existing powers and tend to make the undeveloped portions of greater economic importance.

A discharge measurement of Raquette river was made by C. C. Covert July 22, 1910, at a point near Hosley Camp No. 2, about one mile below Forked lake outlet. Gage height, Forked lake gage 1,741.6 feet; discharge, 60.4 Second-feet.

Raquette River at Raquette Falls, near Coreys, N. Y.

This station is near the center of Raquette falls about 8 miles, by river, upstream from the village of Axton, which is 12 miles, by road, from the village of Tupper Lake. The station was established August 27, 1908, in co-operation with the U. S. Geological Survey, to obtain general statistical and comparative data regarding the flow of Raquette river.

The river has one channel for all stages. The current is favorable for making discharge measurements. The bed of the river is rocky, composed of large boulders, and is permanent. During low water the current is sluggish. At high and medium stages the current is suitable for good discharge measurements.

Measurements are made from a car hung from a cable which was erected during the summer of 1909. Previous to that time measurements were made by wading about 2,000 feet down stream.

A gage reader is only obtainable during the summer, therefore no winter records are available.

The datum of the staff gage has remained the same during the maintenance of the station. The low water portion of the curve is well defined. No measurements have, as yet, been made to determine the high water discharge.

Information in regard to this station is contained in annual reports of the U. S. Geological Survey.

Discharge measurements of Raquette River at Raquette Falls, near Coreys, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 1	C. C. Covert	106	623	5.99	5.8	3,730
May 26	W. G. Hoyt	89	424	2.41	4.26	(*a*)1,020
July 7	W. G. Hoyt	88	252	1.17	2.00	294
July 23	C. C. Covert	67	184	.77	1.40	141
Nov. 7	F. J. Shuttleworth	89	258	1.82	2.54	470

(*a*) Log jam below gage.

Daily gage height, in feet, of Raquette River at Raquette Falls, near Coreys, N. Y., for 1910.

[C. A. DeLancett, observer.]

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	5.75	4.2	4.3	2.4	1.5	1.6	1.9	2.4	2.1
2	......	5.8	4.4	4.5	2.2	1.5	1.7	2.0	2.4	2.1
3	......	5.6	4.5	4.5	2.1	1.4	1.7	2.0	2.4	2.1
4	......	5.4	5.1	4.0	2.1	1.7	1.8	2.0	2.4	2.1
5	......	5.4	5.6	3.8	2.1	1.9	1.9	2.0	2.4	2.1
6	......	5.3	5.4	3.9	2.1	1.9	2.5	2.0	2.4	2.1
7	......	5.4	5.2	4.0	2.0	1.8	2.5	2.0	2.5	2.2
8	......	5.5	5.2	4.2	1.9	1.7	2.5	2.0	2.5	2.4
9	......	5.4	5.1	4.1	1.9	1.7	2.4	2.0	2.5	2.7
10	......	5.4	5.1	4.1	1.8	1.7	2.3	2.0	2.5	2.8
11	......	5.4	5.0	4.1	1.8	1.6	2.2	2.0	2.4	3.0
12	......	5.1	4.8	4.1	1.8	1.6	2.2	2.0	2.4	3.0
13	......	4.9	4.6	3.9	1.8	1.6	2.2	2.0	2.4	2.9
14	......	4.7	4.4	3.8	1.7	1.6	2.1	2.0	2.4	2.7
15	......	4.7	4.3	3.6	1.6	1.8	2.1	2.0	2.4	2.7
16	......	4.5	4.3	3.6	1.6	1.8	2.0	2.0	2.3	2.5
17	......	4.5	4.3	3.6	1.6	1.9	2.0	2.0	2.3	2.3
18	......	4.5	4.4	3.6	1.6	2.0	2.0	1.9	2.3	2.1
19	......	4.7	4.4	3.5	1.5	1.9	2.0	1.9	2.2	2.1
20	......	5.1	4.0	3.4	1.5	1.8	2.0	1.9	2.2	2.0
21	......	4.9	4.1	3.3	1.5	1.8	1.9	1.8	2.2	1.9
22	......	5.1	3.9	3.2	1.5	1.7	1.9	1.8	2.2	1.9
23	......	4.9	3.5	3.0	1.4	1.6	1.9	1.9	2.2	1.9
24	......	4.7	3.7	2.9	1.4	1.6	1.9	1.9	2.1	1.9
25	......	4.5	3.9	2.8	1.4	1.7	1.9	2.1	2.1	1.9
26	......	4.4	4.1	2.8	1.5	1.8	1.8	2.3	2.1	1.9
27	......	4.3	4.3	2.7	1.6	1.8	1.8	2.3	2.1	1.8
28	......	4.3	4.8	2.6	1.6	1.7	1.8	2.3	2.1	1.8
29	......	4.2	3.7	2.5	1.5	1.7	1.8	2.3	2.1	1.9
30	5.15	4.2	3.8	2.4	1.5	1.6	1.8	2.4	2.2	2.1
31	5.6	......	4.3	......	1.5	1.6	......	2.4	......	2.3

Daily discharge, in second-feet, of Raquette River at Raquette Falls, near Coreys, N. Y., for 1910.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	3,660	1,640	1,750	420	170	190	265	420	320
2	......	3,740	1,860	1,970	350	170	215	290	420	320
3	......	3,430	1,970	1,970	320	150	215	290	420	320
4	......	3,130	2,700	1,450	320	215	240	290	420	320
5	......	3,130	3,430	1,280	320	265	265	290	420	320
6	......	2,980	3,130	1,360	320	265	460	290	420	320
7	......	3,130	2,840	1,450	290	240	460	290	460	350
8	......	3,280	2,840	1,640	265	215	460	290	460	......
9	......	3,130	2,700	1,540	265	215	420	290	460	......
10	......	3,130	2,700	1,540	240	215	385	290	460	......
11	......	3,130	2,570	1,540	240	190	350	290	420	......
12	......	2,700	2,320	1,540	240	190	350	290	420	......
13	......	2,440	2,080	1,360	240	190	350	290	420	......
14	......	2,200	1,860	1,280	215	190	320	290	420	......
15	......	2,200	1,750	1,120	190	240	320	290	420	......
16	......	1,970	1,750	1,120	190	240	290	290	385	......
17	......	1,970	1,750	1,120	190	265	290	290	385	......
18	......	1,970	1,860	1,120	190	290	290	265	385	......
19	......	2,200	1,860	1,040	170	265	290	265	350	......
20	......	2,700	1,450	970	170	240	290	265	350	......
21	......	2,440	1,540	900	170	240	265	240	350	......
22	......	2,700	1,360	830	170	215	265	240	350	......
23	......	2,440	1,040	710	150	190	265	265	350	......
24	......	2,200	1,200	655	150	190	265	265	320	......
25	......	1,970	1,360	600	150	215	265	320	320	......
26	......	1,860	1,540	600	170	240	240	385	320	......
27	......	1,750	1,750	550	190	240	240	385	320	......
28	......	1,750	2,320	505	190	215	240	385	320	......
29	......	1,640	1,200	460	170	215	240	385	320	......
30	2,770	1,640	1,280	420	170	190	240	420	350	......
31	3,430	......	1,750	......	170	190	......	420	......	......

NOTE.— Daily discharge based on a fairly well defined rating. Ice conditions which prevailed at this station during December, render the giving of daily discharge impossible.

Monthly discharge of Raquette River at Raquette Falls, near Coreys, N. Y., for 1910.

[Drainage area, 418 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
April	3,740	1,640	2,550	6.10	6.81	
May	3,430	1,040	1,980	4.74	5.46	......
June	1,970	420	1,150	2.75	3.07	......
July	420	150	226	.541	.62	......
August	290	150	218	.522	.60	......
September	460	190	299	.715	.80	......
October	420	240	304	.727	.84	......
November	460	320	388	.928	1.04	......

Raquette River at Piercefield, N. Y.

This station is located at the head of Black rapids, about one-half mile downstream from the dam of the International Paper Company in the town of Piercefield. It was established August 20, 1908, in co-operation with the U. S. Geological Survey to obtain general and statistical data regarding the flow of the Raquette.

There is one channel at all stages. The current is good at medium and high water stages but becomes sluggish under low water conditions. Discharge measurements are made at low and medium stages by means of a boat fastened to a wire, stretched immediately above the head of the rapids.

During high water, measurements are made from the highway bridge above the paper mills. Ice seldom forms at the boat section and in consequence the open water curve has been used throughout the entire year.

A vertical staff gage was formerly located one-third mile upstream from the boat section and about 1,000 feet below the tailrace of the International Paper Company's mill. On September 3, 1910, this staff gage was removed and a chain gage established at the same site and datum. The datum of the gage has remained fairly permanent during the maintenance of the station. The rating table is fairly well defined.

Information in regard to this station is contained in annual reports of the U. S. Geological Survey.

Discharge measurements of Raquette River at Piercefield, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Mar. 28......	C. C. Covert................	124	2,020	1.44	5.7	(*a*)2,920
Mar. 31......	C. C. Covert................	124	2,020	1.82	6.6	(*a*)3,670
May 27......	W. G. Hoyt................	124	1,920	1.26	5.25	(*a*)2,430
July 8......	W. G. Hoyt................	97	548	1.07	2.22	586
Aug. 19......	W. G. Hoyt................	98	499	1.13	2.12	566

(*a*) Measurements made at highway bridge above dam. Pond above and underneath bridge full of pulp wood, which affected surface velocities.
Other measure made from boat at cable.

Daily gage height, in feet, of Raquette River at Piercefield, N. Y., for 1910.
[W. B. Graves, observer.]

DAY.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1................	2.00	2.65	2.40	....	.6.80	....	4.80	1.60	1.9	2.1	2.4	2.50
2................	1.00	2.60	2.70	....	6.80	....	4.35	1.40	1.80	1.00	2.48	2.30
3................	2.00	2.60	2.70	7.45	6.80	....	1.00	1.40	1.70	1.35	2.50	2.30
4................	1.95	....	2.70	7.50	6.85	....	1.00	1.30	0.0	2.10	2.58	0.0
5................	....	2.60	2.70	7.50	6.85	....	3.50	1.40	0.0	2.15	2.50	2.12
6................	2.00	1.50	1.85	7.55	6.70	....	3.40	1.40	1.85	2.10	.15	2.25
7................	....	2.50	3.35	7.50	6.60	....	2.90	0.0	.2.12	2.15	1.55	2.20
8................	1.90	2.70	4.25	7.50	6.40	....	2.25	0.0	.2.10	2.20	2.25	2.00
9................	1.10	2.60	4.25	7.50	6.40	....	2.30	1.65	2.15	.15	2.40	1.90
10................	2.00	....	4.25	7.30	6.40	....	1.00	2.00	2.20	.85	3.05	1.90
11................	....	....	4.25	7.50	6.40	....	2.10	0.0	0.0	1.75	2.65	0.0
12................	2.00	2.50	4.25	7.50	6.35	....	2.20	0.0	3.25	2.10	2.75	0.0
13................	2.60	2.40	3.60	7.50	6.30	....	1.95	0.0	2.30	2.05	0.0	2.10
14................	2.60	2.70	4.80	7.40	5.90	....	2.20	0.0	1.95	2.10	1.70	2.05
15................	2.00	....	4.80	7.30	5.45	....	2.00	0.0	1.75	2.00	3.05	2.00
16................	1.10	2.70	4.85	7.10	5.60	....	1.90	0.0	1.90	.15	3.20	2.00
17................	....	....	4.85	6.80	5.55	....	1.00	0.0	1.60	2.05	3.15	1.55
18................	1.95	2.70	4.85	6.75	5.50	....	2.00	1.00	.20	2.20	3.05	0.0
19................	1.80	2.70	4.80	6.90	5.40	....	2.00	2.15	2.20	2.35	3.10	1.50
20................	2.00	2.70	4.65	6.40	5.10	....	2.05	1.65	2.20	2.40	0.0	2.00
21................	....	2.70	4.65	6.50	5.40	....	2.10	.3	2.20	2.40	1.60	1.90
22................	2.00	2.70	4.60	6.40	5.60	....	2.15	0.0	2.20	2.40	2.40	1.90
23................	1.00	2.70	4.50	6.40	5.60	....	2.20	1.32	2.20	.15	2.80	1.90
24................	2.45	2.70	4.50	5.90	5.60	....	1.00	1.90	2.20	1.30	3.00	1.90
25................	2.50	2.70	4.50	7.00	5.60	4.80	1.75	2.15	.2	2.05	3.00	0.0
26................	2.50	2.90	4.80	6.80	5.40	4.60	2.15	2.05	1.00	2.15	3.10	0.0
27................	2.50	1.90	5.10	6.80	5.40	4.80	2.20	2.00	1.35	2.20	0.0	0.0
28................	2.50	....	6.10	6.90	5.40	5.40	2.20	.20	2.15	2.32	1.65	0.0
29................	2.50	....	6.40	6.90	5.40	5.40	1.95	0.0	2.20	2.40	2.40	0.0
30................	2.10	....	6.90	6.80	5.40	4.80	1.90	1.75	2.10	.20	2.50	0.0
31................	2.55	....	6.65	....	5.40	....	0.0	2.05	....	1.55	....	....

NOTE.— Gage heights January 1 to March 12 are to top of ice. Readings are very poor for this period. June 1 to 24, inclusive, readings considered unreliable.

Daily discharge, in second-feet, of Raquette River at Piercefield, N. Y., for 1910.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	487	735	635	(3,820)	3,980	......	2,020	369	456	521	635	675
2	218	715	755	(4,720)	3,980	......	1,680	316	426	218	667	595
3	487	715	755	4,720	3,980	......	218	316	397	303	675	595
4	472	(715)	755	4,780	4,040	......	218	290	90	521	707	90
5	(480)	715	755	4,780	4,040	......	1,160	316	90	539	675	528
6	487	342	441	4,840	3,870	......	1,000	316	441	521	101	576
7	(472)	675	1,080	4,780	3,760	......	845	90	528	539	356	557
8	456	755	1,600	4,780	3,560	......	576	90	521	557	576	487
9	241	715	1,600	4,780	3,560	......	595	383	539	101	635	456
10	487	(715)	1,600	4,540	3,560	......	218	487	557	186	920	456
11	(487)	(675)	1,600	4,780	3,560	......	521	90	90	412	735	90
12	487	675	1,600	4,780	3,500	......	557	90	1,020	521	778	.....
13	715	635	1,220	4,780	3,450	......	472	90	595	504	90	.....
14	715	755	2,020	4,660	3,050	......	557	90	472	521	397	.....
15	487	(755)	2,020	4,540	2,600	......	487	90	412	487	920	.....
16	241	755	2,060	4,320	2,750	......	456	90	456	101	995	.....
17	(356)	(755)	2,060	3,980	2,700	......	218	90	369	504	970	.....
18	472	755	2,060	3,920	2,650	......	487	218	105	557	920	.....
19	426	755	2,020	4,090	2,560	......	487	539	557	615	945	.....
20	487	755	1,900	3,560	2,290	......	504	383	557	635	90	.....
21	(487)	755	1,900	3,660	2,560	......	521	114	557	635	369	.....
22	487	755	1,860	3,560	2,750	......	539	90	557	635	635	.....
23	218	755	1,780	3,560	2,750	......	557	295	557	101	800	.....
24	655	755	1,780	3,050	2,750	......	218	456	557	290	895	.....
25	675	755	1,780	4,200	2,750	2,020	412	539	105	504	895	.....
26	675	845	2,020	3,980	2,560	1,860	539	504	218	539	945	.....
27	675	456	2,290	3,980	2,560	2,020	557	487	303	557	90	.....
28	675	(456)	3,250	4,090	2,560	2,560	557	105	539	603	383	.....
29	675	......	3,560	4,090	2,560	2,560	472	90	557	635	635	.....
30	521	......	4,090	3,980	2,560	2,020	456	412	521	105	675	.....
31	695	......	3,820	......	2,560	......	90	504	.....	356	.....	.....

NOTE.—Gage heights questionable June 1 to 24 and December 12 to 31. Discharge for these periods withheld.

Monthly discharge of Raquette River at Piercefield, N. Y., for 1910.
[Drainage area, 723 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	695	218	503	.696	.80	B
February	845	342	700	.968	1.01	B
March	4,090	635	1,830	2.53	2.92	A
April	4,840	3,050	4,270	5.91	6.59	A
May	4,040	2,290	3,110	4.30	4.96	A
June	....	....	(2,040)	(2.82)	(2.28)	D
July	2,020	90	587	.812	.94	A
August	539	90	259	.358	.41	B
September	1,020	90	438	.606	.68	A
October	1,300	133	443	1.68	1.94	A
November	2,420	240	736	2.79	3.11	A

NOTE.— Discharge for June based on records at Massena Springs.

Raquette River at Massena Springs, N. Y.

This station is located at the highway bridge at Massena Springs, N. Y. It was established September 21, 1903, was temporarily discontinued October 17, 1903, and resumed April 9, 1904. It is maintained to obtain data regarding the total flow of the river.

The nearest power development is at Raymondville, about eight miles above the station. The Sunday flow of this stream is often held back during the low-water season while ponds at mills above are being refilled, and under these conditions the effect may be shown in the stream for several days.

The vertical staff gage, attached to the right abutment of the upstream side of the bridge from which measurements are made, was replaced on August 15, 1906, by a standard chain gage on the bridge at a datum 1.00 foot lower in order to avoid minus readings. All gage heights during 1906 and thereafter are referred to this new datum. Conditions for obtaining accurate discharge measurements are good, and a good rating table has been developed. During the winter months the discharge is affected by ice.

Information in regard to this station is contained in the annual reports of the New York State Water Supply Commission and the State Engineer and Surveyor and U. S. Geological Survey.

Discharge measurements of Raquette River at Massena Springs, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Mar. 30......	C. C. Covert................	173	1,110	4.22	6.38	4,680
Aug. 23......	W. G. Hoyt................	166	341	1.75	1.90	597

Daily gage height, in feet, of Raquette River at Massena Springs, N. Y., for 1910.

[F. L. Babcock, observer.]

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	6.95	4.70	4.65	3.35	2.05	1.65	1.85	2.50
2	.....	7.10	4.70	4.65	3.20	2.00	1.62	2.15	2.15
3	.....	7.20	4.75	4.50	3.10	2.10	1.75	1.50	2.75
4	.....	7.15	5.05	4.35	2.30	1.90	1.25	2.15	2.85
5	.....	7.05	5.95	4.10	3.35	1.75	1.70	1.95	2.95
6	.....	7.15	6.00	4.40	2.85	1.65	2.20	2.10	2.85
7	.....	7.05	5.65	4.25	2.20	1.85	2.15	1.90	3.05
8	.....	6.95	5.50	4.80	1.85	2.00	2.30	2.70	2.95
9	.....	7.00	5.65	5.00	1.75	2.80	2.45	3.35	2.40
10	.....	6.85	5.65	4.85	2.35	2.45	2.65	3.00	2.65
11	.....	6.95	5.55	4.75	2.05	1.70	2.50	2.80	3.20
12	7.60	6.95	5.65	4.75	2.25	1.60	2.20	2.35	3.05
13	7.70	7.05	5.65	4.90	2.20	1.65	2.35	2.20	3.10
14	7.80	6.95	5.70	4.50	1.70	1.55	2.35	3.15	3.35
15	7.50	6.95	5.25	4.45	1.88	1.75	2.15	2.55	3.40
16	7.45	6.55	5.25	4.60	2.15	1.75	2.35	2.30	2.95
17	7.25	6.20	5.35	4.35	2.05	1.80	2.55	2.00	3.15
18	6.90	6.30	5.25	4.35	1.75	1.65	2.10	2.50	3.25
19	6.65	6.25	5.10	4.45	2.12	1.65	2.15	2.40	3.05
20	7.15	6.35	4.85	4.70	2.15	1.40	2.25	1.95	2.85
21	6.95	6.25	4.70	4.15	2.15	1.25	2.05	1.80	2.80
22	6.90	5.80	4.90	4.15	1.65	1.45	1.60	2.00	3.25
23	6.60	5.60	4.95	4.05	1.90	1.85	1.40	2.25	2.55
24	6.10	5.25	4.65	3.90	1.80	2.05	1.60	2.15	2.35
25	6.30	5.50	4.65	3.72	1.60	1.90	1.65	2.40	2.85
26	6.55	5.40	4.75	3.60	2.20	1.70	1.65	2.45	3.05
27	6.75	5.25	4.75	3.30	2.25	1.70	2.05	2.75	2.80
28	6.80	5.15	4.75	3.30	1.70	1.55	2.30	3.05	2.75
29	6.40	5.05	4.65	3.05	1.60	1.55	1.60	3.30	2.95
30	6.45	4.90	4.50	3.08	1.75	2.00	1.75	3.10	1.65
31	6.60	.....	4.35	.....	2.15	1.40	.....	3.00	.....

NOTE.— River frozen over January 1 to March 11 and December 1 to 31 inclusive.

Daily discharge, in second-feet, of Raquette River at Massena Springs, N. Y., for 1910.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1,050	5,210	2,790	2,740	1,590	675	457	559	955
2	1,050	5,400	2,790	2,740	1,470	645	443	735	735
3	1,050	5,520	2,840	2,600	1,390	705	506	388	1,120
4	1,050	5,460	3,120	2,460	825	586	284	735	1,200
5	1,050	5,330	4,060	2,240	1,590	506	481	616	1,270
6	1,050	5,460	4,110	2,500	1,200	457	765	705	1,200
7	1,480	5,330	3,730	2,370	765	559	735	586	1,350
8	2,200	5,210	3,580	2,880	559	645	825	1,090	1,270
9	3,000	5,270	3,730	3,080	506	1,160	922	1,590	890
10	3,500	5,090	3,730	2,930	858	922	1,060	1,310	1,060
11	5,000	5,210	3,630	2,840	675	481	955	1,160	1,470
12	6,040	5,210	3,730	2,840	795	433	765	858	1,350
13	6,180	5,330	3,730	2,980	765	457	858	765	1,390
14	6,310	5,210	3,780	2,600	481	410	858	1,440	1,590
15	5,900	5,210	3,320	2,550	575	506	735	988	1,630
16	5,840	4,730	3,320	2,700	735	506	858	825	1,270
17	5,580	4,330	3,420	2,460	675	532	988	645	1,430
18	5,150	4,440	3,320	2,460	506	457	705	955	1,510
19	4,850	4,390	3,180	2,550	717	457	735	890	1,350
20	5,460	4,500	2,930	2,790	735	345	795	616	1,200
21	5,210	4,390	2,790	2,280	735	284	675	532	1,160
22	5,150	3,890	2,980	2,280	457	366	433	645	1,510
23	4,790	3,680	3,030	2,190	586	559	345	795	988
24	4,220	3,320	2,740	2,060	532	675	433	735	858
25	4,440	3,580	2,740	1,900	433	586	457	890	1,200
26	4,730	3,480	2,840	1,800	765	481	457	922	1,350
27	4,970	3,320	2,840	1,550	795	481	675	1,120	1,160
28	5,030	3,220	2,840	1,550	481	410	825	1,350	1,120
29	4,560	3,120	2,740	1,350	433	410	433	1,550	1,270
30	4,620	2,980	2,600	1,370	506	645	506	1,390	457
31	4,790	......	2,460	......	735	345	......	1,310	......

NOTE.— Ice conditions March 1 to March 11; daily discharge estimated.

Monthly discharge of Raquette River at Massena Springs, N. Y., for 1910.
[Drainage area, 1,170 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
January	631	....	(690)	(590)	(68)	D
February	....	....	(960)	(820)	(85)	D
March	(6,310)	(1,050)	(4,040)	(345)	(3.98)	B
April	5,520	2,980	4,560	3.90	4.35	A
May	4,110	2,460	3,210	2.74	3.16	A
June	3,080	1,350	2,390	2.04	2.28	A
July	1,590	433	770	.658	.76	A
August	1,160	284	538	.460	.53	A
September	1,060	284	666	.569	.63	A
October	1,590	388	926	.791	.91	A
November	1,630	457	1,210	1.03	1.15	B

Bog River near Tupper Lake, N. Y.

This station is located above Bog river falls, about 300 feet below the forks of Tupper lake stream and Bog river, about two and one-half miles above Big Tupper lake in the town of Piercefield, and about 11 miles southwest of the town of Tupper Lake. It was established August 24, 1908, to obtain data for use in water power and storage investigations.

Since the summer of 1909 discharge measurements are made from a car hung on a cable. Before that time the measurements were made by wading or from a boat.

The staff gage is located about two and one-half miles downstream at the head of Bog river falls and is within a few rods of Big Tupper lake. The elevation of the zero of the gage, based on the United States Geological Survey bench mark at Tupper Lake Junction, according to the levels of the State Water Supply Commission of New York, is 1,563.76 feet above mean tide. The bed of the stream is sandy and contains scattered boulders, but it is probably permanent and a good low-water rating curve has been developed.

Gage readings previous to 1910 were obtained either by a recording gage or by hydrographers and other engineers who periodically visit the station.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Discharge measurements of Bog River near Tupper Lake, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
April 2......	C. C. Covert.................	72	220	1.67	2.82	368
May 20......	W. G. Hoyt.................	65	245	2.02	5.06	444
May 25......	W. G. Hoyt.................	75	289	2.30	3.35	664
July 6......	W. G. Hoyt.................	51	108	.94	1.53	101

Daily gage height, in feet, of Bog River near Tupper Lake, N. Y., for 1910.

[B. O. Lott, observer.]

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	......	2.1	3.4	1.3	1.0	1.0	1.4	1.6
2	......	5.05	3.3	1.3	1.0	1.1	1.5	1.6
3	3.1	4.95	3.2	1.3	1.0	1.2	1.5	1.6
4	2.7	2.65	3.2	1.2	1.0	1.3	1.4	1.6
5	3.1	3.8	3.0	1.2	1.0	1.3	1.5	1.7
6	2.9	3.6	2.8	1.4	1.0	1.2	1.5	1.8
7	2.2	4.45	2.6	1.5	1.0	1.2	1.5	1.8
8	3.7	2.4	2.5	1.5	1.0	1.3	1.4	1.7
9	3.8	5.0	2.5	1.4	1.1	1.4	1.3	1.7
10	3.5	4.95	2.7	1.2	1.2	1.5	1.3	1.7
11	3.8	4.80	2.8	1.3	1.2	1.55	1.3	1.8
12	4.2	4.3	2.7	1.3	1.2	1.5	1.4	1.9
13	3.7	2.7	2.6	1.2	1.1	1.5	1.5	1.9
14	3.6	2.3	2.5	1.1	1.0	1.4	1.5	2.0
15	3.4	2.1	2.5	1.1	1.0	1.4	1.6	2.3
16	5.1	2.1	2.5	1.1	1.0	1.3	1.5	2.4
17	4.8	2.1	2.6	1.1	1.1	1.2	1.4	2.3
18	4.6	2.3	2.8	1.1	1.1	1.3	1.4	2.3
19	2.7	2.2	3.0	1.1	1.0	1.3	1.3	2.3
20	4.1	4.6	2.8	1.1	1.0	1.3	1.3	2.3
21	4.55	4.5	2.6	1.1	1.0	1.4	1.5	2.3
22	1.9	3.1	2.6	1.1	1.0	1.3	1.6	2.3
23	3.1	3.0	2.4	1.1	1.0	1.3	1.5	2.3
24	2.1	3.2	2.1	1.1	1.0	1.3	1.5	2.3
25	1.2	3.45	2.0	1.0	1.0	1.3	1.5	2.4
26	1.6	3.4	1.8	1.0	.9	1.3	1.6	2.4
27	1.9	3.4	1.5	1.0	.8	1.3	1.6	2.1
28	1.9	3.4	1.4	1.1	.8	1.3	1.7	2.0
29	2.0	3.4	1.4	1.1	.8	1.3	1.7	2.0
30	5.05	3.5	1.4	1.2	.8	1.3	1.6	1.9
31	......	3.4	......	1.1	.9	......	1.6	......

Daily discharge, in second-feet, of Bog River, near Tupper Lake, N. Y., for 1910.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	....	186	625	60	28	28	72	100
2	....	1,650	580	60	28	37	85	100
3	495	1,580	535	60	28	48	85	100
4	340	325	535	48	28	60	72	100
5	495	825	455	48	28	60	85	115
6	415	720	375	72	28	48	85	131
7	208	1,230	310	85	28	48	85	131
8	770	254	280	85	28	60	72	115
9	825	1,610	280	72	37	72	60	115
10	670	1,580	340	48	48	85	60	115
11	825	1,470	375	60	48	92	60	131
12	1,060	1,130	340	60	48	85	72	148
13	770	340	310	48	37	85	85	148
14	720	230	280	37	28	72	85	166
15	625	186	280	37	28	72	100	230
16	1,690	186	280	37	28	60	85	254
17	1,470	186	310	37	37	48	72	230
18	1,330	230	375	37	37	60	72	230
19	340	208	455	37	28	60	60	230
20	1,000	1,330	375	37	28	60	60	230
21	1,300	1,260	310	37	28	72	85	230
22	148	495	310	37	28	60	100	230
23	495	455	254	37	28	60	85	230
24	186	535	186	37	28	60	85	230
25	48	648	166	28	28	60	85	254
26	100	625	131	28	20	60	100	254
27	148	625	85	28	14	60	100	186
28	148	625	72	37	14	60	115	166
29	166	625	72	37	14	60	115	166
30	1,650	670	72	48	14	60	100	148
31	....	625	......	37	20	......	100	......

NOTE.— This station discontinued during the period of ice conditions. Daily discharges for the open channel periods, based on a well defined rating.

Monthly discharge of Bog River near Tupper Lake, N. Y., for 1910.

[Drainage area, 132 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				Depth of run-off in inches on drainage area.	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
April (3-30)	1,690	48	658	4.98	5.19	D
May	1,650	186	730	5.53	6.38	C
June	625	72	312	2.36	2.63	B
July	85	28	47.0	.356	.41	B
August	48	14	28.8	.218	.25	B
September	92	28	61.7	.467	.52	B
October	115	60	83.3	.631	.73	B
November	254	100	140	1.06	1.18	B

ST. REGIS RIVER DRAINAGE.

Description.

The St. Regis river has its source in several small streams and lakes in the western part of Franklin county at an elevation of about 1,500 feet above the sea. It first flows in a northwesterly direction for about forty-miles and then somewhat east of north for about 28 miles to its mouth, in the St. Lawrence river near the State line. It has a drainage area of 664 square miles (State Water Supply Commission). The upper portion of its water shed consists of swamp and mountains from which the forest has been largely cut. Upon leaving the plateau the stream descends for 10 or 15 miles through a rugged country with a succession of steep rapids and precipitous falls to the low lands bordering the St. Lawrence.

There are excellent opportunities for developing power in the descent, only a few of which have as yet been utilized. From the foot of the hills to the St. Lawrence, the slope of the river is moderate and rock out-crop not frequent, consequently favorable sites for power development are scarce. According to report of the State Water Supply Commission for 1910, the present limit of profitable development through this low country, except as increased by regulation of stream flow has probably been reached in the existing plants. A detailed description, showing all power developments and future possible developments is given in the 1910 report of the State Supply Commission.

St. Regis River at Brasher Center, N. Y.

This station is located in the village of Brasher Center, 5 miles downstream from Brasher Falls, and about 12 miles above the mouth of the river. It was established August 22, 1910, in co-operation with the U. S. Geological Survey to obtain information regarding the flow of the St. Regis river.

A chain gage is located on the downstream side of the bridge, over the right-hand channel. Low water measurements have been made by wading about 500 feet above the bridge, and high water measurements are made from the bridge. A rating table is not developed as yet and only discharge measurements and gage heights are published.

Discharge measurements of St. Regis River at Brasher Center, near Brasher Falls, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
July 25......	C. C. Covert..............	160	196	.90	(*a*)19.36	176
Aug. 20......	W. G. Hoyt..............	216	359	1.40	4.48	(*b*)505

(*a*) Distance to water surface from reference point on first bridge above Helena.
(*b*) Measurement made at wading section, 200 feet up stream from gage.

Daily gage height, in feet, of St. Regis River, at Brasher Center, near Brasher Falls, N. Y., for 1910.
[George Myers, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Aug.	Sept.	Oct.	Nov.
1	4.12	4.12	4.85	4.42	18	......	4.20	4.38	4.55
2	4.10	4.10	4.85	4.58	19	......	4.20	4.30	4.62
3	4.22	4.10	4.72	4.55	20	......	4.10	4.35	4.65
4	4.18	4.25	4.78	4.70	21	......	4.12	4.25	4.48
5	4.16	4.32	4.78	4.80	22	4.25	4.12	4.10	4.52
6	4.22	4.40	4.88	4.68	23	4.16	4.16	4.12	4.50
7	5.12	5.18	4.98	5.20	24	4.05	4.10	4.25	4.42
8	5.22	5.50	4.88	5.20	25	4.11	4.12	4.60	4.60
9	4.96	5.40	4.82	5.85	26	4.15	4.10	5.25	4.62
10	4.70	5.22	4.78	6.00	27	4.25	4.12	5.45	4.62
11	4.55	4.95	5.05	6.05	28	4.02	4.18	5.50	4.62
12	4.41	4.75	5.08	6.05	29	3.95	4.20	5.40	4.55
13	4.32	4.50	4.98	5.98	30	3.50	4.12	5.35	4.48
14	4.25	4.35	4.88	5.85	31	4.05	......	5.05	......
15	4.22	4.35	4.75	5.35					
16	4.25	4.25	4.78	5.50					
17	4.22	4.35	4.70	5.62					

NOTE.— Ice conditions Dec. 18–31. No gage heights during this period.

LAKE CHAMPLAIN DRAINAGE BASIN.

Description.

Lake Champlain occupies a long and narrow valley, extending in a north-south direction and forming a part of the boundary between New York and Vermont. The elevation of the lake is about 95 feet above tide, and the water-surface area is 436 square miles.

The drainage basin is irregular in form, being about 75 miles wide from a point opposite Middlebury, Vt., northward to the outlet of the lake at Rouse Point, on the international boundary. South of Middlebury the average width of the basin is about 35 miles, and the lake itself is very narrow, forming virtually a drowned river.

The tributary region is rugged and mountainous, covered with little depth of soil except in the stream valleys. The drainage is received almost entirely through large tributaries, there being little direct coast drainage into the lake. The outlet of the lake is Richelieu river, which flows northward from Rouse Point to St. Lawrence river. The total drainage area at the mouth of the lake is about 7,900 square miles (including lake surface).

AUSABLE RIVER DRAINAGE BASIN.

Description.

The Ausable river is formed by the junction of the east and west branches which have their head waters in the northwestern part of Essex county. The east branch has its source in upper Ausable lake, at an elevation of 1,990 feet above sea level. The west branch is formed by several small streams which lie in the valley to the west and north of the east branch. Both branches flow north and east to their junction in the village of Ausable Forks, from which point the river flows northeast, entering Lake Champlain about 10 miles south of Plattsburg and opposite and slightly north of the city of Burlington.

Throughout the entire course, the river is fed by small mountain streams, which enter at nearly right angles from the mountains on either side. There are few lakes in this drainage area to act as a regulator on the flow and, owing to the great differences of elevation throughout the area, the stream has what is called a flashy discharge, its fluctuations being large and rapid.

Owing to the fact that this basin lies on the eastern slope of the Adirondack mountains, the average rain fall is less than for those basins whose streams which rise on the western and southern slopes, the mean yearly precipitation being about 32 inches.

About 6,000 water horsepower is developed at the present time, principally on the west branch. For additional development and storage possibilities on this stream see Fifth Annual Report of Water Supply Commission, pages 88, 147, 267.

Ausable River at Ausable Forks, N. Y.

This station is located in the village of Ausable Forks, about 15 miles above the mouth of the river, immediately below the junction of the east and west branches. It was established August 27, 1910, in co-operation with the U. S. Geological Survey to obtain information regarding the flow of the Ausable river.

A standard chain gage is fastened to a cantilever arm on the right hand bank about 40 feet below the confluence of the east and west branches, in the village of Ausable Forks. Measurements during this year have been made further down stream by wading.

On December 7, 1910, there was installed, 2 miles below the gage, a cable station, at which future measurements will be made.

Discharge measurements of Ausable River at Ausable Forks, N. Y., in 1910.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Aug. 17......	W. G. Hoyt................	207	314	1.04	3.77	(*a*)327
Dec. 9......	Covert & Shuttleworth.......	182	313	.866	3.85	(*b*)271

(*a*) Measurement made at wading section.
(*b*) Measurement made under partial ice cover at cable station.

East Branch, Ausable River.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Sq ft.*	*Ft. per sec.*	*Feet.*	*Sec.-ft.*
Oct. 29......	C. C. Covert...............	137	190	1.52	*17.75	289

* Distance to reference point.

Daily gage height, in feet, of Ausable River, at Ausable Forks, N. Y., for 1910.
[H. Edward Miner, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.60	3.66	3.78	3.72	17	3.76	3.64	3.62	3.72	3.90
2	3.60	3.66	3.72	3.72	18	3.67	3.61	3.66	3.70	3.88
3	3.61	3.83	3.76	3.68	19	3.74	3.62	3.62	3.80	4.02
4	3.68	3.74	3.87	3.70	20	3.68	3.59	3.64	3.69	3.90
5	3.82	3.74	4.08	3.73	21	3.64	3.61	3.61	3.84	3.77
6	4.38	3.78	4.22	3.73	22	3.64	3.60	3.62	3.80	3.88
7	4.09	3.96	4.12	3.86	23	3.62	3.62	3.64	3.76	3.86
8	3.66	3.90	3.82	3.80	24	3.62	3.60	3.68	3.73	3.82
9	3.66	3.80	3.74	3.72	25	3.62	3.56	3.72	3.77	3.88
10	3.72	3.83	3.82	3.83	26	3.62	3.58	3.66	3.74	4.12
11	3.56	3.93	3.82	3.73	27	3.59	3.70	3.80	3.68	3.84
12	3.72	3.82	3.90	3.86	28	3.59	3.69	4.41	3.74	3.74
13	3.62	3.72	3.78	3.87	29	3.62	3.67	4.13	3.68	3.78
14	3.62	3.74	3.77	3.96	30	3.58	3.70	3.80	3.73	3.78
15	3.60	3.68	3.76	4.02	31	3.56	......	3.76	......	4.14
16	3.61	3.62	3.83	3.97						

SUMMARY OF DISCHARGE PER SQUARE MILE.

The following tables of summaries of discharge per square mile are given to allow of ready comparison of relative rates of run-off from different areas considered in this report. They show in a general way the seasonal distribution of run-off and the effect of snow, ground, surface, and artifical storage. But the most important fact worth noting is the almost entire lack of uniformity of agreement between any two stations. It indicates that the discharge of each stream is a law unto itself, and that all projects dependent upon stream flow, if they are to be developed along the safest and most economical lines, must be based on records of stream flow collected with great care over a long series of years as near the location of the project under consideration as possible:

Summary of discharge, in second-feet per square mile, for all river stations for which such data are available in this report.

STATION.	Drainage area.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
	Sq. m.													
Hudson River at North Creek, N. Y	804	1.40	.842	5.21	4.43	2.96	2.29	.632	1.19	1.23	1.41	1.00	.588	1.93
Hudson River at Thurman	1,550	(1.06)	(.839)	(4.90)	4.39	2.55	2.45	.528	.787	.916	1.03	.967	(.555)	1.75
Hudson River at Mechanicville	4,500	1.15	1.22	4.76	3.91	2.05	2.27	.356	.442	.504	.562	.740	.447	1.53
Schroon River at Riverbank	534	.352	.680	3.58	5.21	3.18	2.62	.487	.384	.652	.689	.747	.410	1.58
Sacandaga River at Wells	263	1.56	2.45	8.25	6.08	3.95	3.50	.277	.639	1.32	1.01	1.23	.612	2.57
Sacandaga River at Northville	740	......	......	10.09	6.22	3.55	3.03	.331	.496	.976	2.26	.895	......	......
Sacandaga River at Hadley	1,050	(1.38)	(1.54)	(7.93)	5.78	3.37	3.47	.341	.443	.582	.663	1.08	......	......
Genesee River at St. Helena	1,030	1.14	1.67	5.32	3.01	1.81	.395	.185	.127	.249	2.31	.891	1.12	1.35
Genesee River at Jones Bridge near Mt. Morris	1,410	1.13	1.25	4.96	2.49	1.86	.384	.160	.126	.224	.213	.701	.908	1.20
Genesee River at Rochester	2,360	.814	.924	4.49	1.96	1.75	.384	.161	.123	.226	.228	.547	.492	1.01
Salmon River near Pulaski	264	......	......	......	......	......	......	.655	1.36	1.29	1.68	2.79	1.45	......
Moose River at Moose River	346	......	......	8.76	5.61	3.35	2.35	.746	1.96	1.18	1.97	1.79	.890	......
Oswegatchie River near Ogdensburg	1,580	1.24	1.06	4.92	2.05	1.44	.981	.366	.372	.585	.854	2.03	1.16	1.42
Raquette River at Raquette Falls	418	......	......	......	6.10	4.74	2.75	.541	.522	.715	.727	.928	......	......
Raquette River at Piercefield	723	.696	.968	2.53	5.91	4.30	(2.82)	.812	.358	.606	.168	2.79	......	......
Raquette River at Massena Springs	1,170	(.590)	(.820)	(3.45)	3.90	2.74	2.04	.658	.460	.569	.791	1.03	......	......
Bog River near Tupper Lake	132	......	......	......	4.98	5.53	2.36	.356	.218	.467	.631	1.06	......	......

APPENDIX F.

FINANCIAL STATEMENTS.

APPENDIX F.

CLASSIFIED STATEMENT OF GENERAL OFFICE EXPENDITURES,

February 1, 1910, to December 31, 1910.

1910.	*Receipts.*		
Feb.	1. Unexpended balance of former appropriations		$27,729 42
Oct.	1. By appropriation bill, chapter 512, Laws of 1910		41,680 00
			$69,409 42
	Disbursements.		
	Salaries of commissioners	$20,833 31	
	Salaries of officers	8,731 66	
	Expenses of commissioners	2,393 12	
	Expenses of officers	596 56	
	Office expenses, printing, stationery, furniture, telegraph and telephone, postage, etc	2,474 80	
	Rent of offices	916 66	
	Collecting statistics	415 00	
	Stenographic services	267 97	
			36,629 08
	Balance, December 31, 1910		$32,780 34

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

CLASSIFIED STATEMENT OF EXPENDITURES FOR RIVER IMPROVEMENT SURVEYS AND INVESTIGATIONS.

February 1, 1910, to December 31, 1910.

Receipts.

1910.			
Feb.	1.	Unexpended balance of appropriation under chapter 433, Laws of 1909..	$3,044 66

Disbursements.

Salaries of engineering force......	$1,191 33	
Traveling, maintenance and sundry expenses of engineers..........	158 46	
Legal expenses	1,298 94	
Publishing notices of hearings.....	58 75	
Postage, expressage, etc..........	337 18	
		3,044 66

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

CLASSIFIED STATEMENT OF EXPENDITURES FROM CANASERAGA CREEK IMPROVEMENT FUND.

September 8, 1910, to December 31, 1910.

1910.		*Receipts.*		
Sept.	8.	Proceeds of bonds		$208,013 33
Dec.	31.	Interest on fund		1,923 18
				$209,936 51
		Disbursements.		
		Office equipment and expenses	$961 37	
		Engineering and legal services	6,018 74	
		Traveling expenses	535 68	
		Interest on bonds	5,000 00	
				12,515 79
		Balance, December 31, 1910		$197,420 72

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

CLASSIFIED STATEMENT OF EXPENDITURES FOR SURVEYS AND INVESTIGATIONS UNDER STATE BOARDS AND COMMISSIONS LAW.

June 20, 1910, to December 31, 1910.

1910.	*Receipts.*		
June 20.	Appropriation by supply bill, chapter 513, Laws of 1910		$20,000 00
	Disbursements.		
	Salaries of engineering force	$2,100 73	
	Traveling and sundry expenses of engineers	223 25	
	Maintenance expenses of engineering force	40 07	
	Office rent and equipment	116 25	
	Livery hire	24 50	
	Telephone and expressage	7 69	
			2,512 49
	Balance, December 31, 1910		$17,487 51

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

CLASSIFIED STATEMENT OF EXPENDITURES FOR GENESEE RIVER IMPROVEMENT.

September 24, 1908, to December 31, 1910.

1908.	*Receipts.*		
May	22. Appropriation by supply bill, chapter 466, Laws of 1908		$25,000 00
	Disbursements.		
	Salaries of engineers	$21,603 04	
	Expenses of engineers	2,131 05	
	Test borings	1,071 50	
			24,805 59
	Balance, December 31, 1910		$194 41

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

CLASSIFIED STATEMENT OF EXPENDITURES FOR WATER POWER AND WATER STORAGE SURVEYS AND INVESTIGATIONS UNDER CHAPTER 569, LAWS OF 1907.

(FULLER ACT).

February 1, 1910, to December 31, 1910.

1910.		*Receipts.*	
Feb.	1.	Unexpended balance of former appropriations	$3,374 05
June	20.	Appropriation by chapter 513, Laws of 1910	50,000 00
			$53,374 05

Disbursements.

Salaries of engineering force	$15,365 67	
Office rent and equipment	961 80	
Maintenance expenses of engineering force	590 59	
Traveling and sundry expenses of engineers	1,155 48	
Livery and boat hire	186 55	
Engineering supplies	239 50	
Maps, blue prints and photographs	40 10	
Rental and purchase of instruments	125 29	
Stream gaging in co-operation with U. S. Geological Survey	4,922 13	
Rain gaging	429 61	
Printing and stationery	405 34	
Telegraph, telephone, freight, expressage, etc.	494 09	
		24,916 15
Balance, December 31, 1910		$28,457 90

Note: Detail accounts and vouchers for all disbursements are on file in the office of the Commission, Lyon Block, Albany.

ANNUAL BUDGET

FOR FISCAL YEAR, OCTOBER 1, 1911, TO SEPTEMBER 30, 1912.

On October 4, 1910, the Commission received a communication from the State Comptroller calling attention to chapter 149 of the Laws of 1910, which amended the State Finance Law in such manner as to require from each State Department an advance estimate in detail of all moneys, together with the reasons therefor, for which any general or special appropriation is desired at the ensuing session of the Legislature by such State Department.

The Comptroller's communication was accompanied by blank forms to be used in making out the statement and requested that it was desired to have the summary and schedules transmitted to the Comptroller's Department not later than October 22, 1910.

On October 24th, the Commission, by its President, forwarded to the State Comptroller, the estimates required.

The Comptroller's report to the Governor, under date of December 15th, contained the following statement:

> "An item of $25,000 is desired (by the Water Supply Commission) for surveys, plans, estimates, etc., as required by the State Boards and Commissions Law in connection with public waterways. No item for this specific purpose was appropriated by the last Legislature."

Presumably the item to which the Comptroller referred was an item of $25,000 to cover surveys, investigations, reports, etc., with reference to public water supplies and river improvements for the benefit of public health and safety, and has nothing to do with public waterways. The 1910 Supply Bill appropriated $20,000 for the identical purpose for which this appropriation is now requested.

An item of $50,000 was requested to cover prospective water storage investigations and plans. The exact amount that will be required to carry on such work depends entirely upon what work the Legislature of 1911 may direct the Commission to do.

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PUBLICATIONS OF

STATE WATER SUPPLY COMMISSION

STATE OF NEW YORK

REPORTS

First Annual Report Published February 1, 1906.
Includes Commission's annual report on applications for approval of plans for public water supplies; also summarized statistics of public water supplies and sewage disposal in New York State. Edition exhausted.

Second Annual Report Published February 1, 1907.
Includes Commission's annual report and decisions on applications for approval of plans for public water supplies; also summarized statistics of public water supplies and sewage disposal in New York State, supplementary to statistics published in First Annual Report; also report on River Improvements for the benefit of public health and safety. Edition exhausted.

Third Annual Report Published February 1, 1908.
Includes Commission's annual report and decisions on applications for approval of plans for public water supplies; also report on River Improvements for the benefit of public health and safety; also contains Commission's first Progress Report on Water Power and Water Storage Investigations made under chapter 569 of Laws of 1907, including details of Sacandaga and Genesee river studies. Edition exhausted.

Progress Report on Water Power Development Published March 1, 1908.
This is a revised reprint of the part of the Commission's regular Third Annual Report relating to Water Power and Water Storage Investigations, showing results of engineering studies up to date of publication.

Fourth Annual Report Published February 1, 1909.
Includes Commission's annual report and decisions on applications for approval of plans for public water supplies; also report on River Improvements for the benefit of public health and safety; also contains Commission's second Progress Report on Water Power and Water Storage Investigations, with special details of Raquette and Delaware river studies and supplementary studies on Upper Hudson and Genesee, also a census of water power developments in the State.

Fifth Annual Report Published February 1, 1910.
Includes Commission's annual report and decisions on applications for approval of plans for public water supplies; also summarized statistics relating to public water supplies approved by the Commission in New York State; also report on River Improvements for the benefit of public health and safety; also contains Commission's third Progress Report on Water Power and Water Storage Investigations, with details of reconnaissance studies of Ausable, Saranac, Black, Oswegatchie and other rivers, and a draft of a proposed Water Storage Law.

Sixth Annual Report Published February 1, 1911.
Includes Commission's annual report and decisions on applications for approval of plans for public water supplies; also report on River Improvements for the benefit of public health and safety; also contains Commission's Fourth Progress Report on Water Power and Water Storage Investigations, with details of investigations of Black and Oswego river watersheds, and a revised draft of a proposed Water Storage Law.

MISCELLANEOUS

Pamphlet—"New York State Water Supply Commission" Published September, 1909.
Issued for distribution at State Fair at Syracuse, 1909.

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